REPORT NO. 150

Second Homes in North Carolina

An Analysis of Water Resource and Other Consequences of Recreational Land Development

by

Raymond J. Burby

Center for Urban and Regional Studies
University of North Carolina at Chapel Hill

December 1979

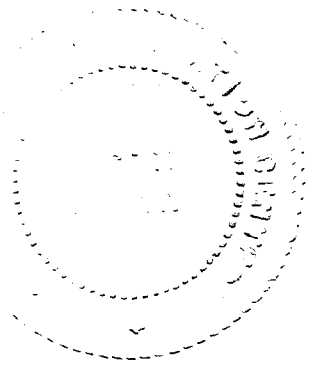
Water Resources Research Institute
OF THE UNIVERSITY OF NORTH CAROLINA

Library of Congress Card Catalog No. 80-50227

Price—$[redacted] $8.00

Copies available from: Water Resources Research Institute
of The University of North Carolina
124 Riddick Building
North Carolina State University
Raleigh, North Carolina 27650

UNC-WRRI-79-150



SECOND HOMES IN NORTH CAROLINA

AN ANALYSIS OF WATER RESOURCE AND OTHER CONSEQUENCES OF RECREATIONAL LAND DEVELOPMENT

by

Raymond J. Burby

Center for Urban and Regional Studies
University of North Carolina at Chapel Hill
Chapel Hill, North Carolina 27514

The work upon which this publication is based was supported in part by funds provided by the Office of Water Research and Technology (A-092-NC), U. S. Department of the Interior, Washington, D. C. through the Water Resources Research Institute of The University of North Carolina as authorized by the Water Research and Development Act of 1978.

Project No. A-092-NC
Agreement No. 14-34-0001-9035

ACKNOWLEDGMENTS

This investigation was supported, in part, by the Water Resources Research Institute of The University of North Carolina (OWRR Project No. A-092-NC). Shirley F. Weiss served as Principal Investigator. A note of thanks is due David H. Howells and Neil S. Grigg, former directors of the Water Resources Research Institute, and James M. Stewart, the Institute's current Acting Director, for their interest and encouragement during the course of this study. The data reported here were provided by hundreds of land developers and local governmental officials in the coastal and mountain regions of North Carolina. Our understanding of second home and recreational land development in the state owes much to the insights they provided.

We would also like to acknowledge the help we received from Todd Miller, who served as project research assistant during the final two years of the study. His diligence and competence eased our work and contributed significantly to the completion of the research. A note of thanks is also due Laurence F. West, project research assistant during the initial year of the study, and the team of twelve interviewers and coders who helped with data collection and processing. Finally, we would like to recognize the contribution of Barbara G. Rodgers, who served as Administrative Aide throughout this study and who supervised production of this report.

ABSTRACT

This report summarizes the findings of an investigation of water resource, economic, fiscal, and social impacts of recreational land development in the coastal and mountain regions of North Carolina. Both regions have experienced major recreational land development activity. By 1976, the coastal region had attracted an estimated 83,690 recreational properties, with an estimated 94,740 recreational properties in existence in the mountain region. Recreational land development in both regions has concentrated in relatively few counties. In addition, recreational development tends to be occurring in the same counties experiencing the most rapid permanent population increases, thus accentuating the potential for adverse impacts. Although a number of uncertainties make market projections for the recreational land development industry complex, information provided by 71 coastal and mountain developers suggests that the market should remain strong through the next decade, particularly in the coastal region.

Most recreational land development firms are of relatively recent origin, small, and, for the most part, limited in the scope of their operations. Firms' motivations for engaging in recreational land development--most often, to gain an adequate rate of return, long-term return on investment and appreciation in the value of land holdings--should create strong interest in environmental quality. However, a number of other characteristics of firms and their operations increase the potential for adverse impacts. In particular, firms tended to seek environmentally sensitive sites for development--property with barrier island ocean frontage in close proximity to established resorts on the coast

and steep sites with views and access to lakes and streams in the mountains--and rarely sought outside professional help in site planning and design. The projects they developed often included private streets which did not meet state right-of-way or construction standards, small community-type water systems, and on-site methods of sewage disposal. In many instances developers retained responsibility for maintaining community facilities, such as private streets, storm drainage systems, and community lakes and beaches, thus creating the potential for deterioration in facilities and environmental damage once projects are sold out. Although developers have experienced some difficulties with governmental regulations, most expect that state and local regulation of the land development process will increase in the future. Land developers were concerned about state regulation of development, but a majority of both coastal and mountain development firms felt that local building regulations, floodway regulations, zoning, and sedimentation pollution control regulations would not have an adverse effect on their industry.

Interviews with 227 local public officials in the coastal and mountain regions of North Carolina revealed widespread knowledge of environmental problems that have occurred as a result of recreational land development. Problems most likely to be perceived by public officials in the coastal region included septic tank failures and resulting pollution problems, sand dune and shoreline erosion, roadside litter, inadequate beach access, and traffic congestion, all of which were identified by over half of the officials interviewed. Major environmental problems that mountain officials frequently identified in relation to recreational land development included soil erosion during road construction activity and later road washouts and other erosion problems from construction on steep slopes, stream sedimentation, septic tank failues, landslides, and flooding. The more land development activity that was occurring within the officials'

jurisdictions, the more likely they were to be aware of environmental problems.

Adverse economic, fiscal, and social impacts have also accompanied recreational land development. Land prices have escalated beyond the means of many native residents to acquire property. Development has produced increasing demands for a wide array of public services--solid waste collection and disposal, sewerage systems, planning and land use regulation, building, plumbing and electrical inspection, police protection, fire protection, parks and recreation, mosquito control, and emergency services. Social problems, such as crime, vandalism, drug use, and traffic congestion were also identified with increasing recreational land development. However, although officials were sharply divided as to whether recreational development was paying its own way (whether service costs exceeded or fell short of increased revenues), they tended to agree that development-generated employment was important in the local economy. Perceptions of employment benefits dominated the officials' overall assessments of recreational land development. Even though they were aware of a number of adverse environmental, economic, fiscal, and social consequences of recreational development, local officials overwhelmingly felt that the benefits from development exceeded the costs.

The public policy challenge posed by second home and recreational land development is to maximize the positive economic benefits, while minimizing various adverse effects. An array of local and state land use and environmental management measures have been brought to bear on the problems that may accompany recreational land development in the coastal region. Coastal officials tend to believe that local land use regulations are effective, and that state imposed septic tank and dredge and fill regulations are helping to minimize future environmental problems. Although they once strongly opposed the Coastal Area Management Act (CAMA), local officials in the coastal region tended to be satisfied with their governments' roles in coastal management and were actively using the

land use plans mandated by the act. Two thirds of the local officials interviewed felt that on net CAMA has been beneficial for their jurisdictions. In contrast, in the mountain region fewer local governments have taken action to plan for and regulate development and fewer state programs designed to mitigate adverse impacts have been adopted. Local officials in the mountain region overwhelmingly felt that existing local land use regulation was ineffective. The apparent success of the Coastal Area Management program and fact that almost a majority of elected mountain officials favored state regulation of development in areas of environmental concern suggest that a major state-local regional environmental management program should be given new consideration for the mountain region of North Carolina. In addition, in both the coast and mountains local officials felt that existing local and state insitutions could do more to promote improved land development practices. Potential new public programs that drew support included the provision of free technical assistance to land development firms, promotion of environmental awareness through high schools and community college programs, and increased citizen oversight of local governmental decision making.

TABLE OF CONTENTS

LIST OF TABLES

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Growth in demand for second homes and recreational land has increased the development potential of rural areas in North Carolina. The benefits of recreational land development--increased recreational opportunities, jobs and improved local businesses, increased tax revenues, and a market for marginal farm land--are widely recognized. Continuing concern, however, has been expressed about the consequences of development for the state's water resources and natural environments. This study was undertaken to provide officials in North Carolina with information that will be useful in assessing the future magnitude of recreational land development in the state, in identifying environmental and other problems that have occurred in the past and are likely in the future as a consequence of development, and in devising appropriate public programs to mitigate existing problem situations and prevent others from occurring.

This report of the study findings draws on three sources of data. These include: (1) secondary data obtained from the Office of Interstate Land Sales Registration in the U. S. Department of Housing and Urban Development and from the U. S. Bureau of the Census; (2) original data obtained through mail questionnaires returned by 71 recreational land development firms operating in the state; and (3) original data obtained from two waves of personal interviews conducted with a sample of 227 local officials. The study areas in which data were collected included 18 mountain and 20 coastal counties in North Carolina.

Recreational Land Development in North Carolina

In 1970, when North Carolina ranked ninth among the states in the nation in terms of the number of second homes within its borders, the state was in the

midst of a boom in recreational land development. By 1976, the coastal region had attracted an estimated 83,690 recreational properties, with an estimated 94,740 recreational properties in existence in the mountain region. Forty percent of the recreational lots in the two study areas were concentrated in only 5 of the 38 counties studied, each of which had over 10,000 recreational properties. In addition, the amount of recreational land development activity was highly correlated with rapid increases in the permanent populations of the counties studied. Thus, second home and recreational land development has not only concentrated in a relatively few coastal and mountain counties, it has concentrated in those counties experiencing the greatest development pressure from other sources. The result to be expected, and that was found, is the generation of various environmental and other problems from land development activity.

Market for Recreational Property

The 1973-75 recession dealt a severe blow to the recreational land development industry and resulted in the failure of a number of large projects in North Carolina. In spite of the industry's sensitivity to the economic cycle, there are basic factors which suggest that over the long term demand for recreational property will be strong. These factors include higher levels of disposable income, increasing amounts of vacation and leisure time, a growing trend toward earlier retirement, and improved mobility as a result of better highways and widespread automobile ownership. The underlying strength of the market is reflected in developers' assessments of consumer demand for various types of recreational property over the next ten years. In both the coastal and mountain regions of the state, recreational land developers expect the market to remain stable or expand, particularly for second homes and improved second home subdivisions. Land developers' perceptions of the market for recreational property were shared by local public officials, most of whom expected development activity

within their jurisdictions to remain stable or to expand.

Recreational Land Development Firms

Most recreational land development firms are of relatively recent origin (formed since 1968), small (annual sales volume of less than $250,000), and limited in the scope of their operations (most have developed only one project during the past 10 years). The major strength of recreational land development firms--small enough scale to maintain close supervision of projects--is also a major weakness noted of the industry as a whole. Firms tend to be undercapitalized and reluctant to expend funds on engineering and scientific site studies. On the other hand, firms' motivations for entering the land development business--most often, to gain an adequate rate of return, build a long-term asset base, and provide a hedge against inflation--indicate that firms have a strong stake in maintaining the quality of the environment so that their investments are not threatened.

Land development firms' operating policies have a strong influence on the subsequent environmental impacts of the projects they undertake. In the case of locational criteria used in siting projects, mountain developers' tendency to seek steep sites (with views) in close proximity to streams and/or lakes accounts for the major water resource problem from development in that region--soil erosion and stream sedimentation. Similarly, coastal developers' concentration on sites with ocean frontage (which requires location on a barrier island) and land in close proximity to an established resort community has produced what are probably the most serious coastal water resource problems from second home development--water pollution from poorly functioning septic tank systems and the threat of loss of life and property damage from hurricanes and coastal storms. Once a site has been selected, potential environmental problems may be mitigated or exacerbated, depending upon the construction and

marketing policies pursued by a firm. Of particular concern was the policy of a number of firms to construct streets and other infrastructure far in advance of demand for lots, thus increasing the potential for environmental damage. On the other hand, over two-thirds of the developers in coastal and mountain regions reported that they had taken steps to minimize adverse environmental impacts of their development projects. Also, as reported below, buildout rates in recreational subdivisions were above national averages so that premature subdivision construction may not be as serious in North Carolina as elsewhere.

Recreational Land Development Projects

The average recreational land development project in the coastal region contained 389 acres and 298 lots. The average project in the mountain region was somewhat smaller, containing 180 acres and 121 lots. Mean buildout rates (proportion of lots occupied with homes) was between 25 and 50 percent in each region, which is well above figures reported for other regions of the nation.

A number of recreational development project characteristics create the potential for water resource problems. First, as noted above, projects tend to be located in environmentally sensitive areas. Second, most projects utilize private streets which, in many cases, do not meet state right-of-way or construction standards. Third, many projects include the use of small, community-type water systems. Fourth, projects often depend on on-site methods of sewage disposal. Finally, in many instances developers have retained responsibility for maintaining community facilities, such as private streets, water systems, storm drainage systems, and community lakes, beaches and marinas. Since a developer's interest in a recreational subdivision tends to fade once the last lot is sold, unless permanent means of maintenance are arranged before that time, maintenance of community facilities will decline and environmental damage can result.

Developers' Experience with Governmental Regulation

A majority of the developers contacted for this study reported that public policies had affected their firms' operations. In a number of instances they complained of increasing public regulation of the land development industry, but at the same time most expected such regulation to increase over the coming decade. When asked specifically about the problem of delays due to governmental regulation, developers tended to be most concerned with delays involved in securing approvals from the U. S. Department of Housing and Urban Development's Office of Interstate Land Sales Registration, and only secondarily with delays attributable to state and local agencies. In spite of the problems they have encountered with governmental regulations, a majority of both coastal and mountain developers felt that building regulations, floodway regulations, zoning, and sedimentation pollution control regulations had either a favorable or neutral effect on their industry. A majority of coastal developers were also favorably inclined or neutral toward sand dune protection regulations and subdivision regulations. However, both coastal and mountain developers felt that the land development industry would be harmed by state regulation of areas of environmental concern and by local government requirements for environmental impact statements.

Environmental Consequences of Development

As thousands of acres of North Carolina shoreline and mountains have been converted to recreational residential use, the environmental consequences of development have become a major public concern. A number of impact assessment methodologies have been formulated to describe and quantify the environmental effects of individual land development projects. The approach used in this study relied on local public officials' perceptions of impacts. In order to insure that officials gave valid responses to questions about specific

environmental problems, whenever an impact was identified, the official was asked to describe the location and nature of the problem that had been observed in connection with recreational land development. Nevertheless, it is recognized that perceptions of impacts depend not only on objective circumstances, but also on the characteristics and values of the observer. Therefore, selected characteristics of the local officials who served as informants for this research were measured and analyzed in relation to their perceptions. Of course, it should also be recognized that information about local officials' perceptions of impacts may be as important as objective impact measurements, since officials' beliefs about development impacts are key factors in their policy and program choices.

Coastal Impacts

Recreational land development has had massive and profound impacts on the water resources and natural environment of the coastal region. Impacts identified by a majority of the officials interviewed included septic tank failures and resulting pollution problems, sand dune and shoreline erosion, roadside litter, inadequate beach access, and traffic congestion. Potential problems that are apparently under control, or are at least much less likely to be observed by local officials, include water supply issues, destruction of wetlands, and potential property losses from hurricanes and coastal storms because of inadequate construction practices.

In a number of instances, coastal officials' perceptions of environmental impacts differed significantly, depending upon the amount of recreational land development that had occurred within their jurisdictions. For example, in the cases of water quality, erosion, and natural hazards problems, officials from the 11 coastal counties with 2,000 or more recreational lots were usually more likely to perceive problems than were officials from the 9 counties with less

recreational land development or officials from 18 coastal resort towns. In the cases of recreation and public access, officials from the four counties with 5,000 or more recreational lots and the coastal resort towns--both of which were more likely to contain ocean beach recreation sites--were those most likely to perceive problems as a consequence of recreational land development.

Mountain Impacts

The major environmental problems from recreational land development that public officials in the mountain region perceived are: first, soil erosion during road construction activity and later road washouts and other erosion problems from construction on steep slopes; second, stream sedimentation; third, septic tank failures; fourth, landslides; and fifth, flooding. Problems that are occurring infrequently or at least are infrequently perceived by public officials include overpumping of groundwater, destruction of wildlife habitats, and air pollution from increased automobile traffic.

Officials from the nine mountain counties with 5,000 or more recreational lots were more likely than officials from counties with less development to identify stream and lake sedimentation problems originating with recreational land development projects. However, for other impacts, the officials' perceptions of problems were not strongly associated with the amount of recreational land development in a county. In part, this finding may reflect the fact that recreational land development and fragile environments subject to adverse impacts are more evenly distributed in the mountain region than in the coastal zone.

Understanding Perceived Impacts

A conceptual model was formulated to help explain how objective characteristics of the environment (impacts) are linked to officials' perceptions of those attributes and to their evaluations of them. The model views an

official's perceptions of environmental impacts as a function of three sets of factors: (1) the social and economic milieu in which the official lives and works; (2) the objective nature (magnitude) of the impact; and (3) the personal values and characteristics of the official. The model was tested using the number of adverse environmental impacts identified by each official interviewed as the dependent variable to be predicted.

In the coastal region, public officials were more likely to perceive adverse environmental impacts of recreational land development if more development had occurred within their jurisdiction, if the jurisdiction was larger in population, and if population growth between 1970 and 1975 had been larger. Each of these factors was also positively associated with perceptions of adverse environmental impacts in the mountain region. In addition, the higher the per capita income of their county, the more likely mountain officials were to perceive adverse impacts. In both the coastal and mountain regions, officials with more years of formal education were more likely than others to be aware of adverse environmental effects. In both regions, officials whose primary occupation was related to real estate (realtors, developers, bankers) were less likely than others to perceive adverse effects. In the coastal region, whether an official was elected or a staff professional was not systematically associated with perceptions of adverse environmental consequences of land development--possibly because planning and environmental education activities carried out under the state's Coastal Area Management program have alerted elected officials to environmental problems they must address. In contrast, in the mountain region staff professionals were much more likely to be aware of the adverse environmental consequences of recreational development than were elected officials.

Social Consequences of Development

Two types of social impacts have been found to accompany recreational land development: (1) social pathologies, such as crime, drugs, and congestion may increase sharply; and (2) rural cultures may change, with resultant alienation of native residents and conflicts between natives and newcomers. Both types of impacts have occurred in the North Carolina coastal and mountain regions. The most frequently noted social problems--observed by a majority of the officials in each region--were increased crime and traffic congestion. Conflicts between natives and outsiders were more likely to be observed by mountain officials--43 percent cited this problem--than by officials in the coastal region, where 29 percent were aware of such conflicts. However, if only counties with a high amount of development (5,000+lots) are examined, the proportion of officials noting conflicts--50 percent on the coast and 47 percent in the mountains--are similar in each region.

Fiscal Consequences of Development

The fiscal impacts of recreational land development hinge on the difference between tax revenues generated by development and the costs of public services that must be provided. In the coastal region of North Carolina, local public officials reported that recreational land development had resulted in increasing demands for nine services: water and sewerage; solid waste collection and disposal; planning and land use regulation; building, plumbing and electrical inspection; police protection; fire protection; parks and recreation; mosquito control; and primary health care and treatment. A majority of the officials in the mountain region saw demand rising for eight services. Solid waste collection and disposal ranked first, followed by increased demand for building, plumbing and electrical inspection, fire protection, police protection, parks and recreation, emergency health care and treatment, planning and

land use regulation, and health care for older residents. In both regions, the more recreational land development that had occurred in a county, the more likely local officials were to perceive service demands as increasing.

In both the coastal and mountain regions there was little consensus among local officials as to whether recreational land development was producing a fiscal surplus or deficit. About half of the officials felt that their jurisdictions were breaking even with recreational land development, with about a quarter feeling that development was producing a fiscal surplus and another quarter indicating that development was costing more to provide services to than it was returning in county revenues. Although differences among counties with varying amounts of recreational land development were not statistically significant, in the coastal region as development (and service demands) rose, officials were more and more likely to believe that increased service costs were outrunning increased revenues.

Economic Consequences of Development

Local officials tended to be concerned about adverse environmental, social and fiscal impacts of recreational land development, but the need for economic development was often a higher priority concern. The need for economic development is a particularly critical issue in the coastal and mountain regions of North Carolina, which have traditionally lagged behind the rest of the state and far behind the rest of the nation in per capita income. In the coastal area, about three-fourths of the local officials interviewed thought that employment associated with recreational land development was either "critical" or "important" to the local economy. In the mountain region, well over 90 percent of the officials rated jobs associated with recreational land development as critical or important to their counties' economies. These economic benefits, however, also brought some economic costs, particularly in the mountains where

local officials felt that development was hurting county farmers as a result of land price escalation and increasing absentee ownership of property.

Overall Evaluations of the Benefits and Costs of Recreational Land Development

Because of the positive economic consequences of recreational land development, local public officials in the North Carolina coastal and mountain regions overwhelmingly believed that development has been beneficial for their counties and towns. In fact, the more recreational land development that had taken place in the officials' jurisdctions, the more likely they were to view its net effects as beneficial. Very few local officials--only 5 percent in the coastal region and 10 percent in the mountains--felt that recreational land development has not been beneficial for their county or town.

Knowledge of environmental and public service impacts of development was not associated with lower overall assessments of the value of recreational land development. Since adverse environmental effects and economic benefits went hand in hand, both increasing with more development activity, officials who were aware of the environmental consequences of recreational land development were more likely to favor development than those who were aware of fewer problems. Clearly, they viewed positive economic effects as outweighing the accompanying environmental and service problems. On the other hand, when officials felt that recreational land development was not paying its own way, they tended to feel that it was no longer beneficial for their jurisdiction. However, most local officials in the coastal and mountain regions felt that recreational projects are at least paying their own way, if not producing a fiscal surplus, so that this factor has yet to dampen many officials' enthusiasm for more development.

Recreational Land Development and Public Policy

The public policy challenge posed by second home and recreational land development is to maximize the positive economic benefits from development, while minimizing various adverse effects. Most adverse effects can be traced to two aspects of recreational land development projects: their location and the quality of site planning and construction. Both the State of North Carolina and local governments have devised policies to address locational and site planning and construction considerations. These policies appear to be working well in the coastal region, but much more public attention to mitigating adverse impacts of land development is required in the North Carolina mountain region.

Local Policies

Zoning and subdivision regulations provide local jurisdictions with the means to affect the location and quality of development. Over 70 percent of the coastal counties studied had adopted subdivision regulations, versus only 33 percent of the mountain counties. A third of the coastal counties had adopted county zoning ordinances, versus only a tenth of the mountain counties. In spite of massive flooding in western North Carolina during 1977, only slightly more than half of the mountain counties had adopted floodway regulations. Also, only about half of the coastal and mountain counties were enforcing the statewide building code, and far fewer had adopted local sedimentation pollution control regulations or were requiring land developers to file environmental impact statements. Differences in coastal and mountain jurisdictions' attention to regulation of the development process were reflected in public officials' assessments of the effectiveness of local regulation in improving the quality of development. Seventy-three percent of the coastal officials rated their local land use regulations as very or somewhat effective. In

contrast, only 29 percent of the mountain local officials rated their regulations as effective.

State Policies

After examining the process of environmental deterioration in the mountain region and local governments' inability to cope effectively with recreational land development projects, a number of previous studies have concluded that the State of North Carolina should play a greater role in monitoring and regulating development to preserve environmental quality. Although efforts to adopt a more aggressive state program of land use and environmental management for the mountain region through passage of the Mountain Area Management Act failed in the North Carolina General Assembly, experience with the state's Coastal Area Management program suggests that a similar mountain program should be given renewed consideration.

Four aspects of the Coastal Area Management Program were explored in some depth with coastal public officials: (1) citizen participation; (2) intergovernmental relations; (3) designation of areas of environmental concern; and (4) the overall impacts of the program. In the first case, the Coastal Area Management program's citizen participation efforts received mixed grades from local officials. A majority of the officials felt that the Coastal Resources Commission had done an excellent or good job of balancing coastal interests, was receptive to input from the public, and had provided adequate opportunities for citizen participation. However, over three-fourths rated actual citizen participation in decisions by the Commission as only fair or poor.

On the other hand, local officials gave the Coastal Area Management program high marks for intergovernmental relations. Four of every five officials felt that their county or town government had been given enough freedom to prepare land use plans in their jurisdiction's best interests. Over three-fourths

felt that enforcement procedures promulgated by the Coastal Resources Commission gave enough weight to their county or town. Finally, seven of every ten officials were satisfied with the distribution of responsibility between the state and local governments for regulating development in areas of environmental concern. A majority of the officials felt that designation of areas of environmental concern was fair to landowners, and most felt that areas needing protection had been so designated.

In exploring the overall impacts of the Coastal Area Management program, local officials were asked about the usefulness of local land classification plans mandated by the program, the effect of the program in reducing environmental disruption, and the overall value of the program for their jurisdiction. Most local officials--over eight of every ten--felt that the policies adopted with their local land use plans would have either a moderate or significant effect on future local governmental decisions. In fact, a majority had already used the plans in making decisions in their official capacities in local government. In the coastal counties where the most land development activity had taken place and where environmental problems were most serious, a majority of the local officials interviewed felt that the Coastal Area Management program had already led to a reduction in environmental disruption from development, even though the program's permitting system had been in effect only a short period when the interviews were conducted. Overall, local public officials felt that the Coastal Area Management program had been beneficial for their jurisdictions. In summary, this evaluation of the state's Coastal Area Management program, which is based on four years of local experience, suggests that the program has been successful in addressing environmental problems caused by coastal development while at the same time giving adequate consideration to local governments' interests. This coastal experience provides a strong endorsement for initiation of a similar state-local management effort in the

mountain region.

Although experience with the Coastal Area Management program argues for initiation of a similar program in the mountain region, a majority of elected officials in the mountains have yet to favor a stronger state role in land use and environmental management. When asked whether they favored or opposed three possible expanded state roles, 26 percent of the elected officials indicated that they would favor mandatory local land classification planning; 40 percent would favor mandatory local land use regulation; and 45 percent would favor state regulation and permitting of land development projects in areas of environmental concern. On the other hand, each of these approaches was favored by from 60 to 94 percent of the local sanitarians, soil conservationists, and county planners who were interviewed. Given the positive coastal experience and positive attitudes among local governmental professionals in the mountains, a basis may be forming for greater state attention to the regulation of land development activity in the mountain region.

In the absence of a more comprehensive approach, the state has had to rely on two programs to insure that land development projects did not adversely effect land and water resources in the mountains: regulation of on-site sewage disposal and sedimentation pollution control regulations. Although over two-thirds of the mountain officials rated the state's septic tank regulations as very effective, a significant proportion--41 percent--indicated that the sedimentation pollution control program was ineffective in preventing erosion from land disturbing activities. To remedy this program's deficiencies mountain officials called for more state enforcement personnel and greater local adoption and enforcement of sedimentation pollution control regulations.

Finally, local officials strongly supported nonregulatory approaches to improving environmental quality. In the mountains, they were in favor of state financial assistance for local land use planning, even when such

assistance included state-imposed standards. In both the coastal and mountain regions, local officials felt that existing state and local institutions--Agricultural Extension Service, Soil and Water Conservation districts, community colleges, economic development councils, community involvement councils, marine resource centers, and county planning commissions--could do more to promote good land development practices. Potential new nonregulatory programs that drew support included the provision of free technical assistance to land developers, promotion of environmental awareness through high schools and community college programs, and increased citizen oversight of local governmental decision making.

In summary, although recreational land development has caused environemtal damage in the past, there are a number of avenues which the State of North Carolina and local governments can pursue to ensure that the benefits of development are realized without excessive adverse consequences for the people and natural environments of the state.

CHAPTER ONE

INTRODUCTION: ASSESSING RECREATIONAL LAND DEVELOPMENT

State and local officials are being called upon to make increasingly difficult decisions about how water and land resources should be used. In many cases decisions are closely tied to related questions about how much and what types of land development should be allowed and where it should be located.

The phenomenal growth in demand for second homes and recreational land has increased the development potential of rural areas in the coastal, Piedmont, and mountain sections of North Carolina and the Southeast. The benefits of recreational land development--increased recreational opportunities, jobs and improved local businesses, increased tax revenues, and a market for marginal farm land--are widely recognized. At the same time, there is continuing concern about the consequences of development for the region's water resources and natural environments. In this study, the water resource and other consequences of second home and recreational land development are examined. The ability of existing public and private institutions to assure that sound water/land planning and management policies are followed in the development of second home projects is assessed, and new policies to promote environmental quality in areas experiencing recreational development pressure are proposed.

The Second Home Phenomenon

Although concern for the consequences of second home development is of recent origin, the second home phenomenon is not new. The seasonal migration of wealthy households from urban to rural areas has been recorded through much

of history. (Coppock, 1977, p. 4) In North Carolina, tourists from the North in winter and from the deep South and Florida in the summer have for years come to the western reaches of the state to enjoy its favorable climate. (The Southern Appalachian Research-Resource Management Cooperative, 1977a, p. 4) The coastal region (Pilkey, et al., 1978) and sections of the Piedmont also have a long history of second home development and seasonal settlement. In recent years, however, the magnitude of development has increased substantially.

In the nation as a whole, it has been estimated that over 5.7 million households (about one out of twelve) own some type of recreational property. (Ragatz, 1974, p. 11) Excluding vacant recreational lots, over 3.5 million households (one in twenty) own second homes, with the annual rate of construction running at about 150,000 units per year. (American Society of Planning Officials, 1976, p. 27) The location of new development has been shifting steadily toward the South. In 1950, about 16 percent of the nation's stock of second homes was located in the South. During the 1960s, however, the U. S. Bureau of the Census (1969) found the rate of new construction to be higher in the South than elsewhere in the nation. As a result, by the 1970 Census the South's share of second homes had almost doubled from 1950, increasing to over 29 percent. In 1970, North Carolina ranked ninth among the states in number of second homes. However, it too has been part of the regional shift of recreational land development. Between 1950 and 1970 North Carolina's share of the national second home housing stock more than doubled, increasing from 1.3 percent to 3.1 percent. (American Society of Planning Officials, 1976, p. 138)

Projections prepared for the Council on Environmental Quality (Richard L. Ragatz Associates, 1974) indicate the most significant increases in the development of recreational property have yet to occur. Five reasons have been given for the expected increase in demand. First, additional discretionary

income will become available to a larger proportion of the population. Second, individual leisure time will increase markedly. Third, the number of persons who choose early retirement will increase, together with the proportion of the elderly population who have the financial resources to invest in recreational property. Fourth, the post World War II baby boom will be reaching the age in the 1980s when the propensity for purchase of recreational property is highest. Fifth, completion of the Interstate Highway System and Appalachian Development Highway System will improve the accessibility of rural areas with high scenic amenities. As a result, the number of households owning recreational property in the South may almost double between 1975 and 1985--from an estimated 2,079,000 households to 3,777,000 households.[1] (Ragatz, 1974) To accommodate this demand, there will be strong pressure to continue the widespread subdivision and development of environmentally attractive, and, in many cases environmentally sensitive, coastal and mountain land.

Environmental Concerns

Recreational land development, as in the case of any type of development, may create severe water resource and other environmental problems. Wastewater disposal problems may result from the use of septic tanks and other ineffective treatment methods. Land modification through large-scale clearing and grading increases erosion and sedimentation, which in turn adversely affect water quality in receiving streams and produce basic ecological and hydrologic changes. Increases in impervious areas associated with large numbers of structures, streets, and parking lots change the nature and water quality of streamflow in developing watersheds. Typically, higher peak flows with an increased potential for flooding, lower flows during dry periods, and degraded water quality occur. Encroachment on flood plains increases the probability of damage to land and buildings when streams overflow their banks, causing great

personal hardship, increased governmental expenditures for relief and rehabilitation, and demands for costly structural solutions. Encroachment on tidal marshlands and freshwater wetlands may result in severe ecological imbalances, reductions in the productivity of estuarine waters, and the loss of important wildlife habitats. Development along the beaches of barrier islands increases the potential for property damage and loss of life from hurricanes and coastal storms, may lead to accelerated erosion, and may degrade scenic qualities and discourage or entirely deny public access for water-based recreation.

These problems and potential problems are not unique to recreational land development. There are several reasons, however, why they may be more acute than in other land development contexts. (American Society of Planning Officials, 1976, p. 45) First, recreational land development tends to occur in areas with outstanding natural attractions, and, in particular, where stream, lake, estuary, and ocean waters provide scenic amenities and opportunities for water-based recreation. Second, because recreational developments are usually intended for seasonal rather than permanent occupancy, and sometimes solely for investment purposes, design and development practices may be far inferior to those that characterize the conversion of land for urban use. Third, recreational land development typically occurs in rural areas where local governments may lack the staff resources, technical expertise, or inclination to ensure that adverse water resource and environmental impacts are avoided through the application of appropriate location and development standards and criteria. In addition, rural service systems may be underdeveloped or totally absent, so that connections to public water and sewage disposal systems are not possible.

Although a comprehensive scientific evaluation of the water resource consequences of second home and recreational land development has yet to be undertaken, previous studies have pointed out particular problem situations in a

number of states.[2] Problems reported include: (1) water pollution from seepage of septic tank effluent due to development on poorly drained soils, areas with shallow topsoil, excessive density, and use of finger canals in coastal development; (2) inadequate public access; (3) encroachment on public recreational land; (4) improper and inadequate storm drainage; (5) widespread erosion; and (6) the destruction of scenic qualities through home construction at the water's edge and through an excessive number of docks, floats, and boathouses.

Several studies have emphasized the lack of adequate water and sewerage systems in recreational land development in North Carolina. (Brunswick County Planning Department, 1976; Great Smokies Regional Planning Team, 1977; Division of Environmental Management, 1979) However, the problem is not unique to this state. According to a draft report on the economic and fiscal consequences of second home development, "The failure to provide adequate sewage treatment on the part of local governments and subdividers or developers is one of the most frequently cited abuses of second home developments." (ULI-the Urban Land Institute, April 1974, pp. 25-26) Various other reports indicate that central water and sewerage systems are generally not available in recreational subdivisions. (Johnson, 1964; Tombaugh, 1968; Reilly, 1973, p. 276; ULI-the Urban Land Institute, 1974; American Society of Planning Officials, 1976) Severe outbreaks of gastrointestinal problems due to over-utilized and nonexistent sewerage systems have been reported (Kimmelman, et al., 1974), and one study suggested, ". . . the foremost issue is the potential for health problems that could be created" (Ragatz, 1973, p. 92) because of inadequate sanitary facilities and urban recreationists' tendency to take the existence and enforcement of environmental health standards for granted.

Adverse Economic, Fiscal, and Social Impacts

Although environmental problems have received the most attention, adverse economic, fiscal, and social impacts may also accompany recreational land development in rural areas. Four economic problems have been identified in relation to recreational and second home development. The most widely noted problem is inflation in land and housing prices, which has been observed in western North Carolina (Cary, et al., 1975; Godschalk, et al., 1975, Parlow, 1976), Tennessee (Stroud, 1974), Texas (Glaze, 1973), Massachusetts (Pizam and Acquaro, 1977), and Virginia (Wunderlich, 1975). As prices escalate, native residents find it increasingly difficult to afford housing. A second and related problem is the negative effect of price inflation on agriculture. In Rappahannock County, Virginia, for example, a case study conducted by the U. S. Department of Agriculture revealed that smaller parcels (associated with increasing subdivision activity) and rising land prices were threatening the continued existence of agricultural activity in the county. (Wunderlich, 1975) A third issue is related to the nature of employment associated with tourism and second home development. Unless a year-round recreational industry is established, seasonal unemployment may create local economic hardships during slack periods of the year. For example, until the recent skiing boom, seasonal unemployment associated with tourism and recreational development was a serious problem in western North Carolina. (LBC&W Consultants, 1975) Finally, recreational land development may result in displacement of existing jobs; while workers moving into higher paying occupations may benefit, other sectors of the economy, such as agriculture, may suffer as wage rates rise and labor is more difficult to secure. (American Society of Planning Officials, 1976)

Often recreational land development creates a fiscal surplus for local governments, with increased revenues surpassing increased costs of providing services to the new development. In some circumstances, however, the impacts

of development may not be beneficial. For example, if recreational subdivisions are poorly constructed or developed with inadequate lot sizes for on-site sewage disposal, purchasers may find that they cannot use their property. When this occurs, owners may abandon their property and fail to pay taxes, as was the case in over two-thirds of the lots in one project studied by the Tennessee State Planning Commission (n.d.).

In other instances, revenue surpluses from recreational land development may not last long. During the early years of recreational land development in a jurisdiction, few public services are needed or provided. A study by the Urban Land Institute (1964, p. 67), for example, found ". . . local governments do not provide services commensurate with even the low level of needs or demands of recreational land development." Three factors can reverse this situation and produce a net fiscal drain from development. First, it has been observed that inexperienced rural governments often do not anticipate future service needs and allow developers to install substandard roads, drainage systems, and other facilities that are eventually corrected at public expense. Second, while septic tanks may operate adequately while densities are low, it has been noted, ". . . it is only a matter of time before failures occur and community health is threatened." (American Society of Planning Officials, 1976, p. 63) Correcting sewage disposal problems in recreational subdivisions can quickly turn a fiscal surplus into a fiscal deficit, particularly if costs exceed residents' willingness or ability to pay. (See Robert N. Nathan Associates, Inc., 1966.) A third factor that can eliminate fiscal surpluses realized from recreational subdivisions is the conversion of vacation housing from seasonal to permanent occupancy. When this occurs, local governments often have little choice but to provide various public services, which, because of the scattered development pattern, may be much more expensive per user than in urban areas of the jurisdiction. (See Ragatz, 1974; Weber, Youmans, and

Harrington, 1979; and American Society of Planning Officials, 1976.) Because of the high costs associated with the provision of educational services, permanent occupancy often does not have to proceed very far before a fiscal surplus turns into a fiscal drain. For example, a fiscal impact study of a proposed recreational subdivision in Virginia showed that if as few as 15 percent of the dwellings in the subdivision were occupied on a permanent basis, the subdivision would cost more to service than it would provide in public revenues. (Hammer, Siler, George Associates, 1973)

Finally, recreational land development may have social costs for the people of rural areas who find themselves swamped by the newcomers who have purchased lots and built homes in recreational subdivisions. For example, psychological problems have been reported among native residents of areas subject to a heavy inflow of recreationists, including, ". . . resentment, lack of rapport, voluntary minimal communication, role strain, stereotyping, and xenophobia." (Pizam and Acquaro, 1977, p. 8) Undesirable social activities may increase, including drug abuse, vandalism, and crimes such as breaking and entering. (American Society of Planning Officials, 1976) The increased seasonal population may produce competition for local services among native residents and outsiders (Southern Appalachian Research-Resource Management Cooperative, 1977b; Parlow, 1976), and the increased level of activity may result in traffic congestion and noise, which can disrupt what was once a tranquil and peaceful community. (Thomas, 1978) However, the most serious adverse social effect may be the transfer of land ownership and control over other local resources from native residents to absentee owners. During the past ten years, for example, ownership of land in the North Carolina mountains has increasingly been transferred to persons living outside of the region. (Cary, et al., 1975; Southern Appalachian Research-Resource Management Cooperative, 1977b) In a Virginia

county that has experienced heavy second home development, over 50 percent of the landowners are absentee owners. (Wunderlich, 1975)

The Study

Water pollution, poor or nonexistent sewage disposal, encroachment on water bodies and environmentally sensitive areas, public access limitations, scenic destruction, economic disruptions, fiscal imbalances, and adverse social impacts are potential problems that are too serious to neglect. Undirected, the rapid expansion in second home and recreational land development that has been underway in North Carolina and other sections of the Southeast can result in serious cases of water resource degradation, conflicts over resource use, and local hardships. On the other hand, with proper planning and the application of sound location, construction, and management practices, recreational land development can augment the supply of outdoor recreational opportunities available to urban residents and can stimulate economic growth in depressed rural areas while avoiding most adverse effects.

Scattered reports of the various problems resulting from second home and recreational land development have alerted state and local officials to the need for improved public oversight of the recreational land development process. Programs designed to cope with the potential adverse consequences of land development have been started, such as the Coastal Area Management program, and others have been discussed. This study was undertaken to provide public officials in North Carolina with information that will be useful in assessing the future magnitude of recreational land development in the state, in identifying environmental and other problems that have occurred in the past and are likely in the future, and in devising appropriate public programs to mitigate particular problem situations and prevent others from occurring.

This report of the study findings draws on three sources of data. These include: (1) secondary data obtained from the Office of Interstate Land Sales Registration in the U. S. Department of Housing and Urban Development and from the U. S. Bureau of the Census; (2) original data obtained from mail questionnaires returned by a sample of land development firms operating in the coastal and mountain regions of North Carolina; and (3) original data obtained from personal interviews with local public officials in the coastal and mountain regions. The developer and public officials surveys are described in greater detail below. The study areas in which these data were gathered included 18 mountain counties and 20 coastal counties in North Carolina.[3]

Recreational land development firms were contacted to gather information regarding firm characteristics, characteristics of the land development projects being developed by the firms, and developers' perceptions of future markets for various types of recreational property and attitudes toward land use regulations. A sampling frame of firms operating in the mountain and coastal study areas was assembled from three sources: (1) previous studies of land development activity in the coastal and mountain regions; (2) the Directory of Recreational Land & Planned Community Developers (Housing Data Bureau, Inc., 1972); and (3) records of the Office of Interstate Land Sales Registration. Using these sources, 191 land development firms in the mountain area and 197 firms in the coastal area were identified. A mail survey of mountain area firms was undertaken in the summer of 1977 (see Appendix A for the questionnaire used) and produced usable responses from 38 firms. A companion mail survey of coastal area development firms was undertaken during the spring of 1978 and produced responses from 33 firms. Of the nonresponding firms in these two mail surveys, approximately one third consisted of firms that were no longer in the land development business, one sixth consisted of firms whose correct current addresses could not be ascertained, and about one half were firms that

failed to return the questionnaire, in spite of three follow-up attempts to secure a response.

Although response rates were higher than those reported by other surveys of land development firms,[4] a follow-up telephone survey of nonrespondents in the mountain region was conducted to check for possible systematic bias in the data. Comparison of the responses of seven firms contacted at random by telephone with the responses from the 38 mountain developers who returned the mail questionnaire indicates that nonrespondents are not too different from the responding firms: the mean number of projects developed over the past 10 years was 1.4 for the responding firms and 1.6 for the nonresponding firms; mean number of lots developed over the past 10 years was 426 for the responding firms and 189 for the nonresponding firms; mean number of employees was 8.6 for the responding firms and 10.8 for the nonresponding firms; and form of organization was 58 percent corporate (public or closely held) for the responding firms and 43 percent corporate for the nonresponding firms. Thus, it appears that data secured from developers are generally representative of the recreational land development firms that are currently active in the state.

A third source of information for this study was local public officials in the coastal and mountain regions. Three surveys of local officials were undertaken to gather data about officials' perceptions of land development impacts, their assessments of current public policies that might mitigate adverse impacts, and their attitudes toward various new policy alternatives. In order to provide a range of local experience and opinion the sample included: (1) chairman of the county commissioners; (2) county manager; (3) county planning director or, if none existed, chairman of the county planning commission; (4) chief sanitarian with the county or district health office; and (5) the soil conservationist serving the county. In addition to county officials in the coastal and mountain regions, the mayor, manager, building inspector, and

chairman of the planning commission were to be interviewed in each of 18 incorporated coastal resort communities located primarily on barrier islands.[5] With very few exceptions interviews were conducted with the designated officials.[6]

The first public officials survey, conducted during the fall of 1977, involved one-hour personal interviews with 81 public officials in the 18 mountain counties selected for study. The second survey, conducted during the spring of 1978, included an interview of similar length with 146 public officials serving the 20 study area counties in the coastal region. These initial surveys focused on perceptions of development impacts and on officials' evaluations of existing local and state efforts to regulate development. Copies of the interview schedules used are provided in Appendices B and C. A follow-up telephone interview was conducted with each of the earlier respondents during the fall of 1978 in order to ascertain the officials' reactions to a variety of new local and state policies that have been proposed as means of improving the quality of development. A copy of the follow-up interview schedule is provided in Appendix D.

The Report

The data collected and analyses conducted over the course of this research are summarized in the following four chapters. Chapter Two examines the recreational land development industry in the coast and mountains of North Carolina. It establishes the magnitude of past recreational land development in these two regions and presents developers' and public officials' perceptions of the market for future development. Characteristics of firms involved in the land development industry and their modes of operation are examined, along with characteristics of their recent land development projects that have implications for water resource problems. Finally, land developers' attitudes toward various

existing and proposed local and state land development regulations are presented.

Chapter Three focuses on public officials' perceptions of adverse water resource and other environmental impacts of recreational land development and public officials' beliefs regarding the persistence of problems over the next ten years. Problems unique to the coastal and mountain regions are examined and the distribution of environmental impacts among counties with varying amounts of recreational land development is presented. The chapter concludes with a discussion of factors associated with local officials' perceptions of environmental problems, including characteristics of the officials themselves and of the jurisdictions in which they were serving.

Economic, fiscal, and social impacts of recreational land development in the coastal and mountain study areas are examined in Chapter Four. As in the preceding chapter, the analysis encompasses not only public officials' perceptions of impacts, but also factors associated with their perceptions. This chapter also summarizes local public officials' overall evaluations of recreational land development as beneficial or not beneficial for their county or community. Officials' overall evaluations are then considered in light of the same officials' perceptions of the various impacts that have accompanied recreational land development to determine those impacts that are most highly associated with overall positive or negative evaluations of development.

In Chapter Five local and state regulations and other public policies affecting the character of recreational land development and the nature of impacts from that development are discussed. The chapter analyzes local officials' evaluations of the effectiveness of existing policies and programs. These include both local land use regulations, such as zoning and subdivision regulations, and major state efforts, such as the Coastal Area Management Act. In addition, officials' attitudes toward expanded roles in land use management

for various institutions are also examined, as well as attitudes toward new programs, such as expanded technical assistance to developers and a mountain area management program paralleling current coastal legislation. Chapter Five concludes with suggestions regarding future state programs to mitigate the adverse effects of water resource and other recreational land development.

Notes

1. Projections of future recreational land development must be viewed with some caution. Recreational property is a luxury good, not a basic necessity, and may be subject to large shifts in demand. Thus, during periods of recession, such as occurred during 1973-75, the market for recreational property plummets, but tends to recover and increase during periods of economic expansion. Another factor that may affect the market for recreational property, the cost and availability of energy, creates a major unknown in projecting future growth. The energy problem may inhibit investment in recreational property by out-of-state buyers, but may make recreational property in North Carolina a more attractive investment to persons currently living within the state.

2. For example, water resource problems have been uncovered by studies of recreational land development, adjacent to lakes, streams, estuaries and ocean beaches in California (Department of Conservation, State of California, 1971; Tahoe Regional Planning Agency, 1971); Florida (Linall and Trent, 1975); Michigan (Fulton, Say, and Bletcher, 1971); Minnesota (Borchert, 1970); North Carolina (Division of Environmental Management, North Carolina Department of Natural Resources and Community Development, 1979; Burby, Donnelly, and Weiss, 1972; Duda, 1978; Pilkey, 1978; Great Smokies Regional Planning Team, 1977; Brunswick County Planning Department, 1976); Rhode Island (Fischer, 1971); Tennessee (Tennessee State Planning Commission, n.d.); Vermont (Sargent and Bingham, 1969; Bevins, 1972); Virginia (Shands, 1974); and Wisconsin (Beuscher, 1969; Born and Yangen, 1973; Klessig, 1973).

3. The mountain region study area included the 18 westernmost counties in North Carolina. These counties include Alleghany, Ashe, Avery, Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, Mitchell, Polk, Swain, Transylvania, Watauga, and Yancey.

   The coastal region study area was chosen to correspond to the 20 counties included in the N. C. Coastal Area Management Act. These counties are: Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hertford, Hyde, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, and Washington.

4. The response rates obtained for the coastal and mountain developer surveys, while low, are higher than those reported for surveys of similar populations. For example, in 1973 the Urban Land Institute conducted a nationwide survey of recreational land development firms. Of 1,880 developers mailed questionnaires, usuable returns were received from only 175 (9 percent). A survey of developers in the Appalachian region, conducted by Richard L. Ragatz Associates, Inc. (1974b), resulted in only 48 usable returns from 510 developers surveyed (9 percent).

5. Recreational land development within incorporated places in the mountain region has been negligible. In the coastal region, however, extensive development has occurred within incorporated towns located primarily on barrier islands. Therefore, officials of these communities were included in the public officials survey in the coastal region. The incorporated coastal resort communities included in the study are: Atlantic Beach, Calabash, Carolina Beach, Caswell Beach, Emerald Isle, Holden Beach, Indian Beach, Kill Devil Hills, Kure Beach, Long Beach, Nags Head, Ocean Isle, Pine Knoll Shores, Sunset Beach, Surf City, Topsail Beach, Wrightsville Beach, and Yaupon Beach.

6. In a few cases the designated officials were indisposed and could not be interviewed. Interviewers were allowed to substitute vice-chairmen and other county commissioners if the chairman could not be interviewed. Of 38 interviews with county commissioners, 74 percent were conducted with the chairman, 13 percent with the vice-chairman, and 13 percent with other commissioners. In the case of other officials, substitutions were not allowed; however, response rates were exceptionally high, including 89 percent with sanitarians, 97 percent with soil conservationists, and 94 percent with the mayors of incorporated coastal resort communities.

References

American Society of Planning Officials. 1976. Subdividing Rural America: Impacts of Recreational Lot and Second Home Development. Washington: U. S. Government Printing Office.

Bevins, Malcom I. 1972. Attitudes on Environmental Quality in Six Vermont Lakeshore Communities. Burlington, Vt.: Vermont Agricultural Experiment Station.

Borchert, John. 1970. Minnesota's Lakeshore: Resources, Development, Policy Needs. Minneapolis: Department of Geography, University of Minnesota.

Born, Steven M. and Douglas A. Yangen. 1972. Understanding Lakes and Lake Problems. Madison, Wis.: Upper Great Lakes Regional Commission, May.

Burby, Raymond J., Thomas G. Donnelly, and Shirley F. Weiss. 1972. Lake Norman Developmental Impact Study. Charlotte, N. C.: Centralina Council of Governments, June.

Brunswick County Planning Department. 1976. Septic Tank Problem Areas in Brunswick County. Bolivia, N. C.: The Author.

Cary, William, Molly Johnson, Meridith Golden, and Trip Van Noppen. 1975. The Impact of Recreational Development: A Study of Landownership, Recreational Development and Land Use Planning in the North Carolina Mountain Region. Durham: North Carolina Public Interest Research Group, April.

Coppock, J. T., ed. 1977. Second Homes: Curse or Blessing? Oxford, England: Pergamon Press.

Department of Conservation, State of California. 1977. Environmental Impact of Urbanization on the Foothill and Mountainous Lands of California. Sacramento: The Author, November.

Division of Environmental Management, North Carolina Department of Natural Resources and Community Development. 1979. Water Quality Management Plan for On-Site Waste Disposal. Draft. Raleigh: The Author, January 1.

Duda, Alfred M. 1978. "Sedimentation," Presentation at DNRCD Symposium on Sedimentation Control, Raleigh, North Carolina, March 20.

Fischer, David W. 1971. Southern Rhode Island Coastal Zone Attitudes. Kingston, R. I.: University of Rhode Island.

Fulton, Jerome J., E. Wayne Say, and Thomas E. Bletcher. 1971. Inland Lakes Reference Handbook. Ann Arbor: Inland Lakes and Shorelands Project, Huron River Watershed Council, August.

Glaze, Freddie Max. 1973. "An Analysis of Rural Subdivision Development on Selected Reservoirs in the Trinity River Basin, Texas." Ph.D. dissertation, Texas A & M University.

Godschalk, David R., Francis H. Parker, and Charles E. Roe. 1975. Land Development in the North Carolina Mountains: Impact and Policy in Avery and Watauga Counties. Chapel Hill: Department of City and Regional Planning, June.

Great Smokies Regional Planning Team. 1977. Guidelines for Recreation Resources Use in the Great Smokies Region. Norris, Tenn.: Division of Forestry, Fisheries and Wildlife Development, Tennessee Valley Authority, September.

Hammer, Siler, George Associates. 1973. Cost-Benefit Analysis for Thunderbird Site. Prepared for Warren County Planning Commission. Washington: The Author, December.

Housing Data Bureau, Inc. 1972. Directory of Recreational Land & Planned Community Developers. Los Altos, Calif.: The Author.

Johnson, Hugh A. 1964. Rural Residential Recreation Subdivisions Serving the Washington, D. C. Area 1963. Agricultural Economic Report No. 59. Washington: U. S. Department of Agriculture, Economic Research Service, Resource Development Economics Division, August.

Kimmelman, Benno, Keith Bildstein, Paul Bujak, William Horton, and Mary Savina. 1974. Studies in the Environment, Volume V: Outdoor Recreation and the Environment. Washington: U. S. Government Printing Office, February.

Klessig, Lowell L. 1973. Lake Property Owners in Northern Wisconsin. An Inland Lake Renewal and Management Demonstration Project, University of Wisconsin Extension and Wisconsin Department of Natural Resources, January.

LBC & W Consultants. 1975. Regional Land Potential Study and Land Development Plan, Region D. Boone, N. C.: Region D Council of Governments, June.

Linall, William N., Jr. and Lee Trent. 1975. "Housing Development Canals in the Coastal Zone of the Gulf of Mexico: Ecological Consequences, Regulations, and Recommendations," Marine Fisheries Review, Vol. 37, Marine Fisheries Review Paper 1163.

Nathan, Robert R. Associates, Inc. 1966. Potential Impact of the Delaware Water Gap National Recreation Area on Its Surrounding Communities. Washington: The Author, February.

Parlow, Anita. 1976. The Land Development Rag: The Impact of Resort Development on Two Appalachia Counties, Watauga, and Avery, in North Carolina. Knoxville: Southern Appalachian Ministry in Higher Education, July.

Pilkey, Orrin H., William J. Neal, and Orrin H. Pilkey, Sr. 1978. From Currituck to Calabash: Living with North Carolina's Barrier Islands. Research Triangle Park, N. C.: North Carolina Science and Technology Center.

Pizam, Abraham and Ernest J. Acquaro. 1977. Some Social Costs and Benefits of Tourism to Rural Communities: The Cape Cod Case. Amherst, Mass.: Massachusetts Agricultural Experiment Station, University of Massachusetts at Amherst, December.

Ragatz, Richard L. 1973. "Vacation Homes in Rural Areas: A Model for Predicting Their Distribution and Occupancy Patterns," in Vacation Housing and Recreational Land Development, Kenneth L. Bernhardt, ed. Ann Arbor, Mich.: Industrial Development Division, Institute of Science and Technology, The University of Michigan.

Ragatz, Richard L. 1974. "Future Demand for Recreational Properties." Urban Land, Vol. 33 (November 1974), pp. 10-21.

Richard L. Ragatz Associates, Inc. 1974a. Recreational Properties: An Analysis of the Markets for Privately Owned Recreational Lots and Leisure Homes. Springfield, Va.: National Technical Information Service, May.

Richard L. Ragatz Associates, Inc. 1974b. Recreational Properties in Appalachia: An Analysis of the Markets for Privately Owned Recreational Lots and Leisure Homes, Springfield, Va.: National Technical Information Service, September.

Reilly, William K., ed. 1973. The Use of Land: A Citizens' Policy Guide to Urban Growth. A Task Force Report Sponsored by the Rockefeller Brothers Fund. New York: Thomas Y. Crowell Company.

Sargent, Frederick O. and William H. Bingham. 1969. Lakeshore Land Use Controls. Research Report MP57. Burlington, Vt.: Vermont Agricultural Experiment Station, March.

Shands, William E. 1974. The Subdivision of Virginia's Mountains: The Environmental Impact of Recreational Subdivisions in the Massanutten Mountain-Blue Ridge Area, Virginia: A Survey and Report. Washington: The Center, February.

Southern Appalachian Research-Resource Management Cooperative. 1977a. Priorities for Natural Resources Research: A Systems Analysis for Western North Carolina. Raleigh: The Author, May.

Southern Appalachian Research-Resource Management Cooperative. 1977b. Western North Carolina Research Resource Management Conference. Proceedings. Asheville: Southeastern Forest Experiment Station.

Stroud, Hubert B. 1974. "Amenity Land Developments as an Element of Geographic Change: A Case Study of Cumberland County, Tennessee." Ph.D. dissertation, The University of Tennessee, Knoxville.

Tahoe Regional Planning Agency. 1971. Limnology and Water Quality of the Lake Tahoe Region. South Lake Tahoe: Tahoe Regional Planning Agency and U. S. Forest Service, July.

Tennessee State Planning Commission. nd. "How Much of Your Shore Line Can You Spare?" Do You Have Surplus Funds in the County Treasury?" Nashville: The Author.

Thomas, June Manning. 1978. "Issues of Social Equity in Planning: The Sea Islands of South Carolina," Paper prepared for presentation at the annual meeting of the American Institute of Planners, New Orleans, September.

Tombaugh, Larry William. 1968. The Location of Vacation Homes in Michigan: A Socio-Economic Study of Environmental Preferences. Ann Arbor, Mich.: University Microfilms.

ULI-the Urban Land Institute. 1974. An Assessment of the Economic and Fiscal Consequences of Second Home and Recreational Land Development. Preliminary Draft. Washington: The Author, April.

U.S. Bureau of the Census. 1969. Second Homes in the United States. Current Housing Reports, Series H-121, No. 16. Washington: U.S. Government Printing Office, June.

Weber, Bruce, Russel Youmans, and Rick Harrington. 1979. Rural Subdivisions and Local Taxes: The Fiscal Impact of "Recreational" and Rural Residential Subdivisions in Klamath County, Oregon. Corvallis, Ore.: Department of Agricultural and Resource Economics and Oregon State University Extension Service.

Wunderlich, Gene. 1975. Land Along the Blue Ridge: Ownership and Use of Land in Rappahannock County, Va. Agricultural Economic Report No. 299. Washington: Department of Agriculture, Economic Research Service, July.

CHAPTER TWO

SECOND HOME AND RECREATIONAL LAND DEVELOPMENT IN NORTH CAROLINA

Although tourism and recreation are major industries in North Carolina and the United States, little information has been available previously about the location of recreational land development projects, characteristics of firms engaged in the land development industry, or the nature of the products produced by these firms.[1] This lack of information is unfortunate, for as former N. C. Governor Robert Scott has observed, "How and where development shall occur is probably the most important question facing the South today." (Scott, 1977, p. 4) The location and characteristics of recreational land development projects play key roles in determining the nature of resulting environmental, economic, fiscal, and social impacts. The character of the firms engaged in this industry and their approach to development are important factors in designing policies to promote better land development practices. Each of these topics is addressed in this chapter. The chapter begins with an analysis of the magnitude and distribution of recreational land development in the coastal and mountain regions of North Carolina. It then examines the future market for recreational property and the characteristics of the firms producing projects to meet market demand. A sampling of recreational subdivisions is then reviewed with particular attention given to project characteristics that may result in water resource and other environmental problems. The chapter concludes with a brief look at land developers' attitudes toward local and state regulation of the development industry and its practices.

Magnitude of Recreational Land Development

In 1970, when North Carolina ranked ninth in the United States in terms of the number of second homes (66,811) within its borders, the state was in the midst of a boom in recreational land development. By 1974, when a precipitous decline in development activity occurred with the recession, the Office of Interstate Land Sales Registration had recorded 127 projects in North Carolina involving a total of 38,424 lots and 92,204 acres. Our own survey of recreational land development in the 20-county coastal and 18-county mountain regions in 1976 produced conservative estimates[2] of 83,690 coastal recreational properties and 94,740 recreational properties in the mountain region.[3] However, as shown in Table 2-1, these properties were not distributed evenly over either region.

Forty percent of the recreational lots in the two study areas were concentrated in only 5 of the 38 counties studied: Avery and Watauga counties in the mountain region and Brunswick, Dare, and New Hanover counties in the coastal region. Each of these counties had over 10,000 second home and recreational properties. Including counties with between 5,000 and 10,000 lots, almost three-fourths of the recreational land development that has occurred in the two regions has taken place in less than half of the study area counties. In addition, recreational land development in both the coastal and mountain regions is occurring in the same counties experiencing the most rapid permanent population increases. The correlation coefficient between county population growth from 1970 to 1975 and the number of estimated recreational lots in a county in 1976, which can range from 0 to + or - 1.0, is +.77 for the coastal region and +.75 for the mountain region. Thus, second home and recreational land development has not only concentrated in a relatively few coastal and mountain counties, it has concentrated in those counties experiencing the greatest development pressure from other sources. The result to be expected,

TABLE 2-1

RECREATIONAL LAND DEVELOPMENT IN THE NORTH CAROLINA MOUNTAIN AND COASTAL REGIONS, 1976[a]

Region and County	Recreational Lots, 1976 Number	Recreational Lots, 1976 Percent	Leisure Homes, 1970 Number	Leisure Homes, 1970 Percent
High Development Counties (5,000+ lots)				
Coast (4)				
Brunswick	22,980	13	3,980	10
New Hanover	12,160	7	3,393	9
Dare	10,500	6	2,360	6
Carteret	9,730	5	2,274	6
Mountains (9)				
Watauga	14,700	8	1,757	5
Avery	10,210	6	654	2
Macon	9,460	5	2,863	8
Jackson	8,230	5	1,008	3
Henderson	8,160	5	2,248	6
Ashe	7,320	4	781	2
Transylvania	7,030	4	807	2
Buncombe	6,360	3	1,910	5
Haywood	5,580	3	1,152	3
Subtotal	132,420	74	25,187	67
Medium Development Counties (2-4,999 lots)				
Coast (7)				
Beaufort	4,710	3	1,545	4
Pender	3,400	2	1,206	3
Onslow	2,810	2	935	3
Pamlico	2,240	1	554	1
Chowan	2,230	1	342	1
Pasquotank	2,190	1	370	1
Bertie	2,130	1	710	2
Mountains (4)				
Polk	2,670	2	511	1
Alleghany	2,540	1	664	2
Madison	2,170	1	415	1
Yancey	2,060	1	532	1
Subtotal	29,150	16	7,784	20

TABLE 2-1 - continued

Region and County	Recreational Lots, 1976 Number	Recreational Lots, 1976 Percent	Leisure Homes, 1970 Number	Leisure Homes, 1970 Percent
Low Development Counties (under 2,000 lots)				
Coast (9)				
Craven	1,750	1	584	2
Currituck	1,550	1	515	1
Washington	1,160	1	386	1
Hertford	1,030	1	343	1
Perquimans	1,010	1	338	1
Hyde	970	*	324	1
Gates	530	*	177	*
Tyrrell	310	*	104	*
Camden	300	*	90	*
Mountains (5)				
Cherokee	1,980	1	412	1
Swain	1,970	1	580	2
Mitchell	1,680	1	526	1
Graham	1,520	1	372	1
Clay	1,100	1	317	1
Subtotal	16,860	10	5,068	13
Total (38 counties)	178,430	100	38,039	

* Less than 0.5 percent.

[a] Data presented in this table were derived from United States Department of Commerce, Bureau of the Census, (1972, Table 60) and unpublished records supplied by the Office of Interstate Land Sales Registration, U. S. Department of Housing and Urban Development.

and that we found, is the generation of various environmental and other problems from land development activity.

As indicated in Table 2-1, recreational land development tends to be more evenly distributed in the mountain than in the coastal region. This reflects the fact that the major amenities attracting development in the mountains--scenery and climate--tend to be ubiquitous in the region. In the coastal area, on the other hand, development tends to be highly concentrated in counties with

barrier island ocean beaches. Significantly less development has taken place in coastal counties, such as Camden, Gates, and Tyrrell, with extensive river and sound waterfrontage, but not land fronting on the Atlantic Ocean. Differences in the concentration of development are reflected in the magnitude and types of environmental problems that have been experienced in each region. These are discussed in Chapter Three.

Market for Recreational Property

Because recreational land development is important to the economy of a number of rural counties in North Carolina, and serious environmental and other problems can result from land development activity, information about the market for recreational property and its future prospects is essential to the formulation of appropriate policies aimed at the land development industry. Unfortunately, market analysis in this industry presents a number of serious problems. First, data about current recreational land development activity are not readily available. Second, the market itself is extremely complex, since it includes a variety of types of property. For example, the vacant property submarket can range from acreage tracts to small lots in resort communities, while the leisure housing submarket can range from trailers and rough cabins through a variety of single-family detached housing types to condominium apartments. Third, since recreational property is not a basic necessity, the market is subject to major shifts, depending on the state of the economy and consumer preferences. Fourth, there are a number of uncertainties about future events and conditions--such as the availability and price of gasoline--that may have a marked effect on the industry. Because of these difficulties and uncertainties, numerical estimates of the future market for recreational properties in the coastal and mountain study areas were not developed. Instead, data were gathered about the market performance of existing recreational land

development projects and land developers and public officials were asked about their expectations regarding future markets for various types of property. This information will be useful in estimating the gross magnitude of future development and, along with information presented in the following chapters, the nature of environmental and other problems that are likely to result.

The market performance of a sample of existing recreational land development projects is summarized in Table 2-2. Based on the reported locations of persons who have purchased property in coastal and mountain recreational subdivisions, it is clear that each region is serving a different market area. The coastal market is dominated by families from North Carolina, Virginia and South Carolina. On the other hand, land development in the mountains depends strongly on demand from persons living in Florida. As a result, higher prices for gasoline and the prospect of gasoline shortages should be felt much more strongly in the mountains and casts a cloud over the industry in that region. Nevertheless, a majority of both coastal and mountain recreational land developers reported that their current projects were meeting or exceeding their sales expectations and a majority in each region reported that they planned to develop another second home project. Coastal developers, however, were more likely than developers in the mountain region to report successful sales results.

The 1973-1975 recession dealt a severe blow to the recreational land development industry and resulted in the failure of a number of large projects in North Carolina. In spite of the industry's sensitivity to the economic cycle, there are basic factors that suggest that over the long term demand for recreational property will be strong. Among those summarized in the preceding chapter (see pages 2-3) are higher levels of disposable income, increasing amounts of vacation and leisure time, including a growing trend toward earlier

TABLE 2-2

MARKET FOR RECREATIONAL PROPERTY IN NORTH CAROLINA - CURRENT EXPERIENCE
(percent of developers)

Indicator	Region	
	Coast (N = 33)	Mountains (N = 38
Current Project - Percent Lots Sold to Residents of:		
North Carolina	54	27
Florida	0	49
Georgia	1	3
South Carolina	5	1
Tennessee	1	1
Virginia	16	3
Other States	23	16
Current Project - Percent of Developers Who Believe Project Will:		
Meet or exceed initial sales pace goals	77	58
Fall short of initial sales pace goals	23	42
Plan to Develop Another Recreational Subdivision		
Yes	67	54
No	33	46

retirement, and improved mobility through better highways and widespread automobile ownership. In addition, new types of recreational property are being developed, such as time-sharing units, recreational properties can now be financed at rates similar to those available for primary homes,[4] and most communities in the coastal and mountain regions of North Carolina welcome development. (Richard L. Ragatz Associates, 1974b, pp. 8-9; Born and Stephenson, 1974)

The underlying strength of the market is reflected in developers' assessments of consumer demand for various types of recreational property over the

next ten years. A number of developers in each region expect the market to expand. See Table 2-3. Coastal developers were more optimistic than their counterparts in the mountain region, but in each case developers were much more likely to see the market for recreational property as stable or expanding than they were to see a decrease in demand. Developers felt that the strongest markets will be for lots in improved leisure home subdivisions and for improved leisure homes themselves. In this regard, recreational land development in North Carolina appears to be part of a national trend. As early as 1976 the American Society of Planning Officials observed (1976, p. 1), "There are preliminary indications that the market for recreational property is shifting away from the unimproved, speculative lot segment of the market towards a user's market of improved recreational lots and second homes." Increased consumer awareness, saturation of the speculative lot market in some areas, and increased land use regulation were cited as reasons for this trend.

The weakest markets appear to be those for high amenity leisure home communities and for resort and time-sharing condominiums. Developers' pessimism about the future market for these types of projects may reflect their experience during the 1973-1975 recession, when projects requiring high front-end expenditures, such as resort communities and multi-family condominium projects, were the first to fail because of the relatively high cash flow needed to meet debt service payments.[5] Often planners have advocated larger projects that have the "front-end" capital for sophisticated planning and environmental protection measures and projects built with multi-family housing types (townhouses and condominiums) so that environmentally sensitive portions of a site can be preserved in a natural state. If developers' pessimism about the future market for these types of projects are an accurate reflection of consumer preferences, then options for environmentally sensitive recreational land development will be severely constrained.

TABLE 2-3

MARKET FOR RECREATIONAL PROPERTY IN
NORTH CAROLINA - FUTURE EXPECTATIONS
(percent of developers)

Region/Property	During Next 10 Years, Expect Market to: Expand	Remain Stable	Decrease
Coastal Development			
High-amenity leisure home communities	30	52	18
Improved leisure home subdivisions	67	23	10
Detached leisure homes	55	28	17
Resort condominiums	48	26	26
Time-sharing condominiums	27	43	30
Unimproved lots	55	24	21
Mountain Development			
High-amenity leisure home communities	33	40	27
Improved leisure home subdivisions	42	44	14
Detached leisure homes	49	49	2
Resort condominiums	27	39	34
Time-sharing condominiums	46	29	25
Unimproved lots	25	58	17

Land developers' perceptions of the market for recreational property in the coastal and mountain regions are generally shared by local public officials in those same regions. As shown in Table 2-4, 60 percent of the coastal officials we interviewed and 75 percent of those in the mountain region expect that the number of recreational land developers that are active in their jurisdictions over the next five years will increase markedly or slightly. Very few officials see a downturn in the market for recreational property. On the other hand, local officials seem to share developers' pessimism regarding the prospects for large, high-amenity recreational projects. When asked to rate the probability of a large, 100 or more acre project being built within their jurisdiction over the next five years, a majority of both the coastal and

TABLE 2-4

PUBLIC OFFICIALS' EXPECTATIONS REGARDING
RECREATIONAL LAND DEVELOPMENT
(percent of officials)

Expectation	Region	
	Coast (N = 146)	Mountains (N = 74)
During Next Five Years, Number of Developers That Are Active in Jurisdiction Will:		
Increase markedly	23	43
Increase slightly	37	32
Remain about the same	39	18
Decrease	1	7
During Next Five Years, Probability of Large Subdivision (100 or more acres) Being Developed in Jurisdiction is:		
Very high	8	8
High	9	15
Medium	24	22
Low	59	55

mountain officials rated the likelihood of such a project being built as low.

In summary, a considerable amount of second home and recreational land development has occurred in North Carolina and much more seems certain to be on the way. As a result, an array of water resource and other problems are likely to continue and may become even more serious as even more development takes place.

Recreational Land Development Firms

Most recreational land development firms are of relatively recent origin (formed since 1968), small (annual sales volume of less than $250,000), and, for the most part, limited in the scope of their operations (most have developed only one project during the past 10 years). See Table 2-5. Although most

TABLE 2-5

SELECTED CHARACTERISTICS OF RECREATIONAL LAND DEVELOPMENT FIRMS
(percent of developers)

Characteristic	Region	
	Coast (N = 33)	Mountains (N = 38)
Year Firm Established		
Prior to 1963	21	18
1963 to 1967	12	11
1968 to 1972	43	34
1973 to 1977	21	30
Not ascertained	3	7
Organization		
Single ownership	13	29
Joint venture/partnership	26	13
Closely-held corporation	52	55
Public corporation/subsidiary	9	3
Functions in Addition to Development		
Building	41	45
Property management	22	24
Real estate sales	66	18
Other	10	13
Number of Employees (mean)	9.8	8.6
Number of Land Development Projects - Past 10 Years		
One	61	74
Two	9	18
Three or more	27	5
Not ascertained	3	3
Number of Subdivision - Past 10 Years (mean)	1.9	1.4
Number of Lots Developed - Past 10 Years (mean)	685	426
Sales Volume (1976)		
Less than $100,000	48	66
$100,000 - $249,999	22	26
$250,000 - $499,999	7	3
$500,000 or more	23	5

TABLE 2-5 - continued

Characteristic	Region: Coast (N = 33)	Region: Mountains (N = 38)
Strengths of Firm (entrepreneur's report)[a]		
Small enough scale to maintain close supervision of projects	84	89
Knowledge of market	66	61
Reputation and track record	56	44
Sufficient resources for large-scale planning and development	25	25
Patient capital	25	22
Ability to raise new capital	16	22
Capacity to pioneer conceptual design, or marketing advances	22	17
Ability to attract superior architects and builders	6	22
Application of scientific management methods	3	22
Diversity of projects (spread of risk)	3	14

[a] In the mountain area developer survey, developers were asked to rank the strengths of their firm; in the coastal survey to check up to three as their firm's most important strength. Only the top three strengths mentioned by each mountain firm are tabulated in this table.

firms had a narrow focus of activity (concentrating on residential land development), many also engaged in building and, in the coastal area in particular, in real estate sales. Major strengths of these firms, according to their owners, are small enough scale to maintain close supervision of projects, knowledge of the market, and their reputation and record for good work.

The major strength of recreational land development firms--small scale--is also a major weakness noted of the industry as a whole. For example, observing that recreational land developers are frequently undercapitalized, Born and Stephenson reported, "Many of the problems subsequently encountered could be prevented with more extensive before-the-fact engineering and scientific site studies, but developers commonly are reluctant to do "too much studying"

in view of this capital shortage." The probable lack of attention to sophisticated planning and site analysis by land development firms is also suggested by North Carolina developers' indications of the strengths of their firms. As shown in Table 2-5, only a quarter or less of the developers responding to our survey listed as strengths of their firm "sufficient resources for large-scale planning and development," "capacity to pioneer conceptual, design, or marketing advances," or "ability to attract superior architects and builders." In fact, commenting on land development in the North Carolina mountains, the Public Interest Research Group (Cary, et al., 1975, p. 20) noted, "One of these problems is tied to the fact that many of the second home subdivisions are built by small operators without the financial resources of the major resort developers. These people often do not have the technical or economic capabilities to perform adequate environmental impact studies so important when building in the fragile, easily-abused mountain region." Developmental problems attributable to low capitalization and inexperience also have been observed in the mountain region of Georgia. (See Georgia Mountains Planning and Development Commission, 1974.)

Recreational land development firms active in the coastal and mountain regions of North Carolina were in most respects very similar. The major difference observable from the data summarized in Table 2-5 is that coastal development firms tend to be somewhat larger. They have developed more subdivisions over the past 10 years, have a higher dollar sales volume, and slightly more employees than developers located in the mountain region. In part this may reflect the fact that the market for recreational property is somewhat more robust in the coastal area than in the mountains. Although information about recreational land developers in other states and regions is sparse, North Carolina developers do not appear to be too different than their counterparts elsewhere. For example, a survey conducted by the American Land Development

Association in 1973 and reported by the American Society of Planning Officials (1976, p. 34) indicated, ". . . a majority of recreational land development firms limited their activity to developing a single project at one time," and that, "Most recreational land development firms have been in business a relatively short while." (Over 70 percent of those studied had been in business less than 15 years.) Finally, in a survey of recreational land developers active in the Appalachian region, Richard L. Ragatz Associates, Inc. (1974b) found that over 70 percent had sales volumes of less than $500,000 per year.

North Carolina land developers' motivations for entering the land development business are summarized in Table 2-6. The most frequently cited motivations in both the coastal and mountain regions were to gain an adequate rate of return, build a long-term asset base, and provide a hedge against inflation. As shown in the table, a majority of the developers felt that their projects had met or exceeded their financial goals. However, reflecting developers' perceptions of the market and sales experience reported earlier, coastal developers were much more likely than mountain developers to have had financially successful experiences in this business.

It is noteworthy that land developers' motivations for being in the development business are more likely to hinge on gaining an adequate long-term return on their investment and on appreciation in the value of their holdings than on gaining current income or a quick return. Presumably these firms have a strong stake in maintaining the quality of the environment so that their investments are not threatened.

Firms' Operating Policies

Land development firms' operating policies may have a strong influence on the impacts of the projects they undertake. For example, locational criteria applied when seeking and acquiring land for development determine whether or

TABLE 2-6

FIRMS' MOTIVATION FOR ENGAGING IN LAND DEVELOPMENT AND EVALUATION OF FINANCIAL SUCCESS
(percent of developers)

Motivation/Evaluation	Region	
	Coast (N = 33)	Mountains (N = 38)
Motivation for Entering Land Development - Reasons Rated Very Important		
Gain adequate rate of return	65	51
Build long-term asset base	65	49
Provide hedge against inflation	48	41
Gain current income	39	32
Use excess property	20	16
Use excess cash	16	5
Use land under development pressure	11	5
Diversify business	16	5
Gain tax shelter	7	3
Extent to Which Land Development Projects Have Met Initial Financial Goals		
Exceeded financial goals	22	8
Met financial goals	56	49
Fallen short of financial goals	22	43

not fragile or environmentally sensitive sites are sought or avoided. Construction policies determine the amount of land disturbed at one time and the extent of environmental disruption from development activities. Each of these aspects of firms' operating policies is examined here.

Key factors firms considered in selecting the site of their latest recreational subdivision and the price per acre paid for the land are summarized in Table 2-7. Major differences and similarities are apparent in the site selection criteria most often used by coastal and mountain developers. In the coastal region, distance from an established resort and ocean frontage were key factors, mentioned by over two-thirds of the developers, that were not important (or not applicable) to mountain developers. In the mountains, on the other

TABLE 2-7

OPERATING CHARACTERISTICS: LAND ACQUISITION
(percent of developers)

Characteristic	Region	
	Coast (N = 33)	Mountains (N = 38)
Cost of Raw Land for Last Recreational Subdivision		
Less than $250/acre	23	20
$250 - $500/acre	5	14
$500 - $999/acre	27	29
$1,000 - $1,999/acre	22	20
$2,000 or more/acre	23	17
Key Factors in Selection of Site for Last Recreational Subdivision: Rated Very Important		
1. Distance to established resort	74	8
2. Ocean front	69	NA
3. Availability of groundwater	61	42
4. Topography (views, vistas)	58	78
5. Scenic approach to site	55	69
6. Paved road access to site	55	56
7. Tree cover	42	44
8. Distance to major highway	42	42
9. Size of parcel	39	36
10. Surface water (streams, lakes)	35	44
11. Access to public water system	34	NA
12. Lack of zoning	19	25
13. Access to public sewer system	9	NA

hand, topography (views and vistas), a scenic approach to the site, and the availability of surface water (streams and lakes) played relatively more important roles in site selection than on the coast. In both regions, a number of developers (over four of every ten) were concerned with the availability of ground water, paved road access to the site, tree cover, and distance to a major highway when they considered land for development. Relatively unimportant site location factors (cited by fewer than 40 percent of the developers) included access to a public sewerage system, access to a public water system,

zoning protection, and the size of the parcel.[6]

The tendency of mountain developers to seek steep sites (with views) in close proximity to streams and/or lakes accounts for the major water resource problem from development in the mountain region--soil erosion and stream sedimentation. Similarly, coastal developers' concentration on sites with ocean frontage (which requires location on a barrier island) and land in close proximity to established resort areas has produced what are probably the major coastal water resource problems from second home development--water pollution from poorly functioning septic tank systems and the threat of loss of life and property damage from hurricanes and coastal storms. Since developers' site selection criteria represent their perceptions of land desired by consumers, site selection policies are not likely to change unless there is a marked shift in consumer preferences. Alternatively, developers may be forced to select suboptimal (from consumers' and developers' perspectives) sites if governmental regulations or prior land acquisitions limit or preempt the use of environmentally sensitive sites that are attractive for development.

Once the site for a recreational land development project has been selected, potential environmental problems may be mitigated or exacerbated, depending upon the construction and marketing policies pursued by a firm. These policies are summarized in Table 2-8. Given the small scale of most of these developers, it is alarming that the vast majority firms did not use outside experts for subdivision planning and site design. Instead, over three-fourths of the coastal and mountain land developers reported using their own staffs for this critical task. Again, this reflects the tendency noted earlier for firms to be undercapitalized and to scrimp on site analysis and site design studies prior to undertaking construction activities.

Often, environmental impacts resulting from recreational land development occur during the construction stages of development, particularly in connection

TABLE 2-8

OPERATING CHARACTERISTICS: CONSTRUCTION AND MARKETING
(percent of developers)

Characteristic	Region	
	Coast (N = 33)	Mountains (N = 38)
Responsibility for Subdivision Planning and Site Design		
Developer/staff	79	81
Consultant	21	19
Timing of Street and Other Infrastructure Construction		
Constructed as "front-end" development one or more years ahead of sales and building development	34	48
Phased program less than one year ahead of sales and subsequent building development	59	35
Other	7	17
Perceived Advantages (A) and Disadvantages (D) of "Front-End" Development: Rated Very Important		
Increased financing costs (D)	53	54
Increased maintenance costs (D)	40	43
Economies of scale (A)	37	32
Minimize community disruption (A)	33	25
Flexibility in meeting unforeseen demand (A)	24	43
Increased environmental disruption (D)	23	25
Use excess cash (A)	10	18
Use excess construction capacity (A)	4	7
Problems Encountered in Project Development: Rated Serious or a Problem But Not Serious (in parenthesis)		
Cost overruns	19 (23)	21 (35)[a]
Labor problems	13 (23)	12 (28)
Nonfamiliarity with coastal/mountain development	10 (10)	8 (32)
Terrain obstacles	6 (26)	28 (24)[a]
Materials shortages	3 (26)	4 (7)[a]
Steps Taken to Minimize Environmental Problems		
Yes	71	68
No	29	32

TABLE 2-8 - continued

Characteristics	Region: Coast (N = 33)	Region: Mountains (N = 38)
Marketing Methods: Tried and Produced Good Results or Poor Results (in parenthesis)		
In-house sales staff	65 (11)	56 (13)
Realtors	52 (23)	24 (49)
Local newspaper advertisements	45 (32)	21 (43)
Outside local area newspaper advertisements	45 (16)	3 (35)
Outdoor billboards	35 (16)	3 (24)
Direct mail	23 (29)	8 (16)
Radio advertisements	13 (26)	5 (13)
Television advertisements	7 (26)	0 (0)

[a] In the mountain developer survey, developers were asked to rank these three problems along with two others (not shown). The first figure shown is the percent of developers who ranked problem most serious; the second figure is the percent of developers who ranked the problem second most serious of the five problems.

with road construction and clearing and grading building sites. In order to minimize these impacts, it is sometimes recommended that construction be staged so that a minimum amount of land is disturbed and subject to erosion at any one time.[7] As shown in Table 2-8, a majority of developers in the coastal region phased street and other infrastructure construction so that construction activity occurred less than one year ahead of expected sales and subsequent building of structures. On the other hand, in the mountains, where erosion is a much more serious environmental problem, almost a majority of the developers--48 percent--said streets and other infrastructure were constructed as "front-end development" one or more years ahead of sales and building activity. The advantages developers perceived from "front-end" as opposed to "phased" development included achieving economies of scale, minimizing later disruption of

the community when additional lots are needed, and flexibility to meet unforeseen demand. The major disadvantages they noted were increased financing costs, increased maintenance costs, and increased environmental disruption. Each of these advantages and disadvantages of front-end as opposed to phased development was mentioned by 23 percent or more of the developers queried.

Developers were asked about problems they encountered in project construction. Most frequently mentioned were cost overruns and labor problems. In the mountain region, however, it is significant that a majority of the developers also cited terrain obstacles as a problem (28 percent rated it a serious problem) and 40 percent noted their nonfamiliarity with mountain development had caused problems (though only 8 percent felt the problem in this case was serious). Developing difficult terrain and lacking prior experience, it seems likely that mountain developers would exacerbate the environmental disruption that normally accompanies land disturbing activities.

Nevertheless, over two-thirds of the developers in both the coastal and mountain regions claimed to have taken steps to minimize environmental damage. In the coastal region developers were most likely to report that they had left as much terrain in an undisturbed natural state as possible (reported by over a third of those responding to this question). About a quarter of the coastal developers indicated that by carefully abiding by all appropriate governmental rules and regulations they had limited environmental problems. Others reported specific environmental practices, such as taking care in grading sand dunes, using silt fences to stabilize dunes, and using the "blue-green" approach to surface drainage (creating lakes to hold drainage). Attacking bank erosion problems was the major environmental concern of mountain developers. Half of the developers reporting that they had taken some steps to protect the environment mentioned seeding banks and taking care in grading and constructing drainage works as means of minimizing environmental damage. Mountain developers

also reported leaving as large an area as possible in its natural state and meeting governmental development regulations were means they used in protecting the environment.

Characteristics of Recreational Subdivisions

Although recreational land developers usually were involved in only one subdivision at a time, as shown in Table 2-9, the project tended to be rather large. Over a third of both the coastal and mountain subdivisions surveyed were over 100 acres. Over 40 percent of the coastal and over 20 percent of the mountain subdivisions had 200 or more lots. At the time of our surveys, an average of 28 percent of the lots in coastal subdivisions and 45 percent of the lots in mountain subdivisions had been built upon. These figures are significant, since a major criticism of recreational land development has been a tendency for "premature" subdivision of land--development too far in advance of market demand for actual building sites, so that sites remain idle in a "nonproductive" use for long periods. A key indicator of premature subdivision is a low buildout rate. However, buildout rates in the coastal and mountain regions appear to be higher than those found in other surveys, where rates ranging from 4 percent to 21 percent have been reported.[8] Thus, the problem of premature subdivision may not be as serious in North Carolina as elsewhere in the nation.

Table 2-9 also summarizes selected characteristics of recreational subdivisions currently being developed by the sample of land development firms. Features that indicate the potential for water resource problems include: (1) the widespread use of private streets which, in most cases, do not meet state right-of-way or construction standards; (2) use of small, community-type water systems; (3) major reliance on on-site methods of sewage disposal; and (4) the fact that less than a majority of the mountain-area projects had piped storm

TABLE 2-9

RECREATIONAL LAND DEVELOPMENT PROJECT CHARACTERISTICS
(percent of developers' most recent projects)

Characteristics	Region: Coast (N = 33)	Region: Mountains (N = 38)
Acreage		
Less than 25	12	13
25 - 49	12	21
50 - 99	30	26
100 - 199	15	13
200 or more	19	27
Not ascertained	12	0
Mean	389	180
Lots		
Less than 25	6	13
25 - 49	3	39
50 - 99	18	16
100 - 199	18	11
200 or more	43	21
Not ascertained	12	0
Mean	298	121
Buildout		
Mean percent of lots with homes	28.4	45.3
Water-Related Project Features		
1. Private streets	77	89
2. Central water system	48	69
3. Central sewer system	26	9
4. Piped storm drainage	42	44
5. Curb and gutter	16	6
6. Community lake	32	49
7. Community beach	45	NA
8. Marina	32	NA
Other Project Features		
1. Landscaped entrance	68	64
2. Underground telephone and electricity	74	39
3. Tennis courts	39	39
4. Street lights	52	26

TABLE 2-9 - continued

Characteristics	Region: Coast (N = 33)	Region: Mountains (N = 38)
Other Project Features - continued		
5. Club house	32	22
6. Golf course	26	23
7. Swimming pool	23	19
8. Child play area	29	20
9. Stables	3	14

NA = Not applicable.

drainage or curb and gutter to prevent erosion from storm runoff of steep roads and slopes. Characteristics of coastal and mountain subdivisions were similar in many respects. Mountain subdivisions were more likely to use central or community water systems, while coastal subdivisions, possibly because of closer access to incorporated resort communities, were more likely to include installation of or access to a sanitary sewerage system. Characteristics of recreational land development projects in North Carolina are also similar to those reported for projects in other sections of the nation. For example, review of four studies of recreational land development conducted during the early 1970s (see Richard L. Ragatz Associates, Inc., 1974a, p. 184) indicates that community water systems were used in from 53 percent to 66 percent of the projects surveyed by these studies, and central sewerage systems were available in from 9 percent to 42 percent of the projects.

Several reasons have been given for developers' reluctance to install sewerage systems and other infrastructure designed to minimize water resource problems. For example, according to Born and Stephenson (1974, p. 28), ". . .

few recreational land developers have been willing to install sewer systems because of (1) the formidable early ("frontend") financial requirements and the difficulty in obtaining loans, (2) low density development layouts with questionable build-up rates and highly variable loadings, and (3) a desire to terminate involvement with the development at an early date." Also, it has been noted that developers may keep infrastructure costs low simply as a means of maximizing profits.[9]

In addition to underbuilding needed community facilities in recreational subdivisions, developers may fail to give adequate attention to institutional mechanisms for maintaining properly those facilities that are provided. This can be a critical failing, since rural local governments are often unable to assume responsibility for the upkeep of subdivision facilities. If local government is unable to act, operation and maintenance responsibilities may be retained by the developer, assigned to a property owners association, or left to individual lot purchasers. The second method, formation of a property owners association, is probably the best approach, since it insures that persons with a long-term interest in the subdivision have an organized means of maintaining the property. However, as shown in Table 2-10, this approach was only infrequently used by recreational land developers in North Carolina. In many instances the developer had retained responsibility for maintaining community facilities, such as private streets, storm drainage systems, curb and gutter, and community lakes and beaches. This approach may work well while projects are actively under development, but usually produces problems when the developer's interest fades after the last lot is sold. In this respect it appears that North Carolina recreational land developers are not too different from their counterparts in other states. For example, a review of projects filing with the Office of Interstate Land Sales Registration in the U. S. Department

TABLE 2-10

OPERATION AND MAINTENANCE RESPONSIBILITY FOR FEATURES RELATED TO WATER RESOURCES
(percent of projects with feature)

Feature/Responsibility for Operation and Maintenance	Region	
	Coast (N = 33)	Mountains (N = 38)
Private Streets		
Developer	50	45
Property association	42	33
Individuals	8	15
Other	0	6
Central Water System		
Developer	27	48
Property association	13	28
Individuals	0	4
Other	60	20
Central Sewer System		
Developer	33	0
Property association	11	50
Individuals	0	0
Other	56	50
Piped Storm Drainage		
Developer	39	63
Property association	23	19
Individuals	0	6
Other	38	12
Curb and Gutter		
Developer	40	33
Property association	40	0
Other	20	67
Community Lake		
Developer	50	44
Property association	30	39
Other	20	17

TABLE 2-10 - continued

Feature/Responsibility for Operation and Maintenance	Region	
	Coast (N = 33)	Mountains (N = 38)
Community Beach		
Developer	43	NA
Property association	36	NA
Individuals	14	NA
Other	7	NA
Marina		
Developer	45	NA
Property association	33	NA
Commercial lessee	11	NA
Other	11	NA

NA = Not applicable.

of Housing and Urban Development indicated that of those projects using private roads and where maintenance responsibility could be determined, 45 percent assigned project maintenance responsibility to the developer, in 35 percent it rested with a homes association, and in 20 percent with individual lot purchasers. (American Society of Planning Officials, 1976, p. 23) These figures are very similar to those reported by North Carolina recreational land developers and summarized in Table 2-10.

Developers' Attitudes Toward Governmental Regulation

The high potential for water resource and other environmental problems from recreational land development in the coastal and mountain regions of North Carolina indicate that there is a strong need for public intervention to insure that the quality of the environment is maintained during the development process. The data summarized in Table 2-11 indicate that although

many developers have been affected by governmental regulations, most have not experienced serious problems in securing various governmental approvals for their projects.

Fifty-eight percent of the coastal developers and 51 percent of the mountain developers reported that public policies had affected their firms' project location decisions. In a number of instances they complained of increasing public regulations, noting that provisions of the Coastal Area Management Act, septic tank regulations, sedimentation regulations, dredge and fill regulations, and local zoning and subdivision regulations were unfair or were developed by persons who were unfamiliar with the land development industry.

Often, developers have complained of delays caused by the need for development permits and other governmental approvals. This problem was explored in our surveys of coastal and mountain developers. Mountain developers, for example, were asked whether governmental cooperation was a factor in their project's construction performance not meeting their expectations. Only 20 percent reported that governmental noncooperation was either very or somewhat important in the disappointing project performance they experienced. See Table 2-11. We also asked mountain developers to rank four problems that are often encountered in development, including (1) delays in governmental approvals, (2) materials shortages, (3) terrain obstacles, and (4) cost overruns. Delays in governmental approvals was ranked first among these four problems by 41 percent of the mountain developers and second or third by another 21 percent. In the coastal survey, we probed for the specific types of governmental delays that were causing problems. As shown in Table 2-11, developers tended to be most concerned with delays involved in securing approvals from HUD's Office of Interstate Land Sales Regulation, and only secondarily with delays attributable to state and local agencies. A majority of the developers

TABLE 2-11

LAND DEVELOPERS' EXPERIENCE WITH GOVERNMENTAL REGULATIONS
(percent of developers)

Indicator	Region: Coast (N = 33)	Region: Mountains (N = 38)
Public Policies Have Affected Firm's Land Development Location Decision		
Yes	58	51
No	42	49
Problems Encountered with Governmental Regulation		
Government noncooperation as a reason for project performance not meeting expectations		
Very/somewhat important	NA	20
Not important	NA	80
Delays in governmental approvals ranked among five critical development problems[a]		
First	NA	41
Second or third	NA	21
Fourth or fifth	NA	37
Delays in government approvals rated as a problem in developing project:		
HUD OILSR approval		
Serious problem	40	NA
Problem, not serious	23	NA
Not a problem	37	NA
Corps of Engineers approval		
Serious problem	16	NA
Problem, not serious	26	NA
Not a problem	58	NA
State agencies		
Serious problem	29	NA
Problem, not serious	39	NA
Not a problem	32	NA
Local agencies		
Serious problem	16	NA
Problem, not serious	41	NA
Not a problem	44	NA

NA = Question not asked.

indicated that delays in securing a dredge and fill permit from the Corps of Engineers was not a problem.

Although developers have experienced some problems with governmental regulations, as shown in Table 2-12, most expect that local and state regulation of the land development process will increase in the future and that enforcement of environmental regulations will be greater than in the past. Developers located in the mountain region were most likely to expect increases in local land use regulation, while those on the coast, reflecting the existence of the state's Coastal Area Management Program, were most likely to expect increases in state regulation. Contrary to popular belief and in spite of the problems they encountered with governmental regulations, developers were not universally opposed to regulation of the development process. In fact, a majority of both coastal and mountain developers felt that building regulations, floodway regulations, zoning, and sedimentation pollution control regulations had either a favorable or neutral effect on their industry. A majority of coastal developers were also favorably inclined or neutral toward sand dune protection regulations and subdivision regulations. However, both coastal and mountain developers felt that their industry would be harmed by state regulation of areas of environmental concern and local government requirements of environmental impact statements. Thus, these data shown that in a number of instances developers recognize that some environmental safeguards may be needed, though they prefer that regulations be applied at local levels of government.

TABLE 2-12

LAND DEVELOPERS' EXPECTATIONS OF AND ATTITUDES TOWARD GOVERNMENTAL REGULATIONS
(percent of developers)

Indicator			
Expectations Regarding Governmental Regulation	Expect Regulations to be		
	Greater	Same	Less
Coastal Region (N = 33)			
Local land use and building regulation	79	17	3
State land use and building regulation	93	3	3
Enforcement of environmental regulations	83	7	10
Mountain Region (N = 38)			
Local land use and building regulation	92	5	3
State land use and building regulation	78	16	6
Enforcement of environmental regulations	83	14	3
Perceived Effect on the Residential Development Industry of Increasing Coverage and Enforcement of Regulations	Perceived Effect on Industry		
	Desirable	No Effect	Undesirable
Coastal Region (N = 33)			
Sand dune protection regulations	76	14	10
Zoning regulations	61	7	32
Septic tank regulations	55	17	28
Building regulations	52	26	22
Subdivision regulations	48	10	42
Floodway regulations	45	21	34
Sedimentation regulations	45	16	39
Dredge and fill regulations	38	14	48
Environmental impact statement requirement	23	6	71
State regulation of areas of environmental concern	21	10	69
Mountain Region (N = 38)			
Zoning	41	13	46
Building regulations	39	36	25
Floodway regulations	39	28	33
Sedimentation regulations	35	22	43
Subdivision regulations	35	8	57
Environmental impact statement requirement	14	11	75
State regulation of areas of environmental concern	11	19	70

Notes

1. The paucity of information about recreational land development also has been noted by other observers. For example, according to Allan, Kuder, and Oakes (1976, pp. 5-6), "The actual scope of the retail land-sales industry's operations in the United States, while clearly enormous, has never been precisely defined. Accurate figures on the number of companies, the volume of sales, the location of projects, the acres of land subdivided, and the number of lots marketed have simply not been tabulated by any agency, association, or person." Similarly, one of the leading consulting firms to the recreational land development industry, Richard L. Ragatz Associates, Inc. (1974a, p. 33) has observed, "Reliable figures for the number of recreational properties, especially for the existing number of total recreational lots in the country are not available."

2. Estimates of the magnitude of recreational land development in the coastal and mountain regions are based on data from the 1970 Census of Housing and information obtained from the Office of Interstate Land Sales Registration (OILSR) in the U. S. Department of Housing and Urban Development. The estimates are based on the assumption that in 1970 there were at a minimum two times as many vacant recreational lots as lots occupied by second ("rural seasonal vacant" and "other rural vacant") homes recorded by the Census in 1970, and that most new development has since registered with OILSR. Although similar estimating procedures have been used elsewhere (see Richard L. Ragatz Associates, Inc., 1974b, p. 46), this procedure probably undercounts the number of recreational properties that are actually in existence for at least two reasons. First, the assumption that one out of three recreational lots has had a second home constructed on it corresponds with other findings of this study (see Table 2-9), but is higher than the build-out rate reported in studies of recreational subdivisions in other regions. Second, the assumption that all new development registers with OILSR also produces an undercount, since Title XIV of the Housing and Urban Development Act of 1968, under which OILSR was created, only required a developer to register with OILSR if the subject subdivision contained more than 50 lots and only if property was to be marketed out of state. Thus, smaller projects and/or projects marketed wholly within a state are not included in data obtained from OILSR. Also, OILSR estimates that during the first half of the 1970s more than half of the eligible properties might not have registered as required by the law. (Richard L. Ragatz Associates, Inc., 1974b, p. 23) In sum, the estimates developed for this research are very conservative.

3. Related estimates of recreational land development and second homes in the mountain region have been prepared by Richard L. Ragatz Associates, Inc. (1974b). The North Carolina Public Interest Research Group (Cary, et al., 1975) has examined land ownership patterns in a sample of 10 mountain counties focusing on increasing absentee ownership. Based on changes in landownership patterns, forecasts of changes in future development activity by county were prepared. For comparative purposes, it is interesting to note that a study of recreational land development in a 13-county study area in the Georgia mountains estimated that over 44,000 lots had been subdivided by the mid-1970s in that region. (Georgia Mountains Planning and Development Commission, 1974, p. 30) In comparison, we estimated that

94,740 recreational properties had been subdivided in our 18-county North Carolina mountain study area by early 1976.

4. Of course, high interest rates, such as those experienced throughout 1979, will affect customers' willingness to purchase property. As late as a decade ago, however, consumers often encountered problems financing seasonal dwellings, regardless of their willingness to pay prevailing interest rates.

5. North Carolina developers' post-recession perceptions of the market for condominium and resort development contrast sharply with the results of a survey of recreational land developers made in 1973 just before the recession started. For example, 81 percent of a national sample of developers expected the market for lots in high amenity second home communities to exapnd and 84 percent thought that the market for resort condominiums would expand. (See American Society of Planning Officials, 1976, p. 38.) In contract, only 30 percent of the coastal developers and 33 percent of the mountain developers who responded to our post-recession survey thought that the market for lots in resort communities would expand and only 48 percent and 46 percent, respectively, saw the market for resort condominiums as expanding.

6. Several other studies have also found that recreational land developers tend to seek out sites that, while providing natural amenities that are attractive to consumers, also increase the probability of water resource and other environmental damage from development. In the report of the American Society of Planning Officials' (1976) national study of recreational land development, it was noted, "Water appears to be the biggest natural attraction to second home owners." (p. 30) Other studies have noted that in addition to access to water, consumers prefer sites with forests, steep slopes, access to resorts, and seclusion. (Dinger, 1970; Johnson, 1977)

7. For example, the U. S. Department of Agriculture, Soil Conservation Service has recommended, "Land grading (for roads and other purposes) causes many problems when not performed correctly or when areas are too large. Grading should proceed no further ahead of actual development than is absolutely necessary." (Cited in Allan, Kuder, and Oakes, 1976, p. 113)

8. See Richard L. Ragatz Associates, Inc., 1974a, pp. 230-233 for a review of previous surveys of buildout rates in recreational subdivisions.

9. For example, a study of Boise Cascade Recreation Communities found, "In an effort to maintain 33 percent profit, the firm cut corners in the provision of urban improvements and services . . . . (and) Of even greater significance, however, was the inadequate provision of waste disposal and water supply. The apparent reason for this was that septic tanks and individual water wells allowed Boise to transfer the cost from its profit structure to the customers." (Boschen, 1974, p. 147)

References

Allan, Leslie, Beryl Kuder and Sarah L. Oakes. 1976. Promised Lands. Volume 1: Subdivisions in Deserts and Mountains. New York: Inform, Inc.

American Society of Planning Officials. 1976. Subdividing Rural America: Impacts of Recreational Lot and Second Home Development. Washington: U. S. Government Printing Office.

Born, Steven M. and David A. Stephenson. 1974. Environmental, Geologic Aspects of Planning, Constructing, and Regulating Recreational Land Developments. Madison, Wis.: Upper Great Lakes Regional Commission, January.

Boschen, Herman L. 1974. Corporate Power and the Mismarketing of Urban Development: Boise Cascade Recreation Communities. New York: Praeger Publishers, Inc.

Cary, William, Molly Johnson, Meridith Golden, and Trip Van Noppen. 1975. The Impact of Recreational Development: A Study of Landownership, Recreational Development and Land Use Planning in the North Carolina Mountain Region. Durham: North Carolina Public Interest Research Group, April.

Dinger, Julius J. 1970. "Recreational Real Estate." Urban Land, Vol. 29 (May), pp. 3-12.

Georgia Mountains Planning and Development Commission. 1974. Survey and Analysis of the Environmental Impact of Leisure-Oriented Residential Developments. Gainesville, Ga.: The Author, January.

Johnson, Brian Arthur. 1977. "The Transition of Rural Land to Absentee Ownership of Second Homes in Columbia, County, Pennsylvania: A Geographic Perspective," Doctor of Education Dissertation, The Pennsylvania State University, State College, Pennsylvania.

Richard L. Ragatz Associates, Inc. 1974a. Recreational Properties: An Analysis of the Markets for Privately Owned Recreational Lots and Leisure Homes. Springfield, Va.: National Technical Information Service, May.

Richard L. Ragatz Associates, Inc. 1974b. Recreational Properties in Appalachia: An Analysis of the Markets for Privately Owned Recreational Lots and Leisure Homes. Springfield, Va.: National Technical Information Service, September.

Scott, Robert. 1977. "The Importance of Natural Resources to the Welfare of Western North Carolina," in Western North Carolina Research Resource Management Conference. Proceedings. Asheville, N. C.: Southeastern Forest Experiment Station, 1977, pp. 1-5.

United States Department of Commerce, Bureau of the Census. 1972. U. S. Census of Housing, 1970, Detailed Housing Characteristics. Washington: U. S. Government Printing Office.

CHAPTER THREE

WATER RESOURCE AND OTHER ENVIRONMENTAL CONSEQUENCES OF DEVELOPMENT

As thousands of acres of North Carolina shoreline and mountains have been converted to recreational residential use, the environmental consequences of development have become a major public concern. In the preceding chapter, attributes of recreational land development firms and their projects that may lead to environmental problems were identified. In this chapter, the extent to which the high potential for environmental degradation has actually resulted in specific adverse environmental impacts is examined. Because of their different environmental characteristics, the water resource and other environmental consequences of development in the coastal and mountain regions are discussed separately. Following these sections, the analysis focuses on the geographic distribution of environmental impacts within each region, giving particular attention to the association between land development activity and the emergence of environmental problems. The chapter concludes with a discussion of the nature of environmental perceptions and how they are influenced by both objective attributes of the environment and the characteristics of the observer.

A number of impact assessment methodologies have been formulated to describe and quantify the environmental effects of individual land development projects.[1] While we are concerned with the actual impacts produced by development, objective measurement of the whole range of impacts of interest was not feasible within the time and budget constraints of this research. As an alternative, the study focused on perceived impacts. Perceived impacts are a

function of actual impacts as colored by the values of the observer. The nature of these environmental perceptions is explored later in the chapter. In order to increase the probability that actual impacts would be identified, interviews were conducted with a range of public officials, all of whom were in a position to have some knowledge of land development and its impacts within their jurisdictions. These officials included county commissioners and town mayors, county managers, professional planners and planning commission chairmen, county and district sanitarians, and district soil conservationists. In order to insure that officials gave valid responses to questions about specific environmental problems, whenever an impact was identified, the official was asked to describe the location and nature of the problem that had been observed.

In addition to serving as a proxy for more objective measurements of environmental impacts, perceived impacts are an important indicator of public officials' awareness of and concern for the consequences of recreational land development. In this regard, measures of perceived impacts may be just as critical as measures of actual impacts, since it is public officials' perceptions that lead to specific policy conclusions and decisions. As Bevins (1972, p. 41) has observed, "Natural resource conservation is a highly desirable goal, but local people--not just conservationists--must support it. (Surveys can) . . . yield basic information planners need to develop realistic environmental programs that local people can support." According to Mazmanian and Sabatier (1979, p. 49), "While academic scientists and professionally-oriented officials may be very interested in the actual <u>impacts</u> . . . what is of most concern from the view of changes in the statuatory mandate and . . . evaluation by the political system is the perceived impacts." Thus, knowledge of how local governmental officials view the impacts of recreational land development is essential in designing policy proposals to deal effectively with those impacts.

Impacts in the Coastal Region

Recreational land development has had massive and profound impacts on the water resources and natural environment of the coastal zone. In this section, six sets of problems resulting from development are identified and discussed. They include: (1) water quality problems; (2) water supply problems; (3) shoreline, dune and other erosion problems; (4) wetlands and dredging problems; (5) hurricane and flooding problems; and (6) problems with recreation and public access. In considering each set of impacts, attention is given to presence of the problem at this time and to its potential seriousness over the coming ten years.

Water Quality Problems

Most recreational land development projects--about three-quarters of those surveyed in the coastal zone--depend on septic tanks and other on-site methods of sewage disposal. In this regard, recreational land development is not unique. In 1970, over 40 percent of all housing units in North Carolina used septic tank systems. The coastal zone, however, is unique, and has been found to be generally unsuitable for proper septic tank functioning. According to the North Carolina Division of Environmental Management (1979b, p. 33), "Unsuitable soil types, a watertable very near the surface, a shallow very porous aquifer, fill placed on compacted old marsh surface, high rainfall, very small lots bordered by canals or marsh, and high population densities during seasonal peaks combine to cause septic tank failure and sewage release into shellfish waters." In fact, two shoreline surveys conducted by the North Carolina Shellfish Sanitation Unit, Division of Health Services, during August through January 1974 and February through July 1977 in the Wrightsville Beach area found each time that 3 percent of the septic tanks inspected were not functioning properly. (North Carolina Division of Environmental Management, 1979b, p. 20)

As a result of septic tank failures and other causes, over 400,000 acres of shellfishing areas in North Carolina have been closed because of pollution. (Pilkey, Neal, and Pilkey, 1978, p. 63)

In addition to pollution of tidal creeks and estuarine waters, increasing concern has been expressed over the high potential for pollution of finger canals constructed in connection with recreational land development projects. Pilkey, Neal, and Pilkey (1978, p. 65) have enumerated six problems associated with finger canals, including: "(1) lowering of the groundwater table; (2) pollution of groundwater by seepage of salt or brackish canal water into the groundwater table; (3) pollution of canal water by septic seepage into the canal; (4) pollution of canal water by stagnation due to lack of tidal flushing or poor circulation with sound waters; (5) fish kills generated by higher canal-water temperatures; and (6) fish kills generated by nutrient overloading and deoxygenation of water." According to a study of finger canals in Florida, "These conditions produce waterways with a paucity, or a complete absence, of desirable fish and aquatic life and which eventually become so contaminated that they are unsafe for body contact . . . . The contaminated condition of labyrinthine canal systems presents a health hazard to both animals and humans, threatens the quality of receiving waters, and creates costly problems in maintenance for both individual property owners and public agencies." (Barda and Partington, 1972; also see Horowitz, 1978 and Linall and Trent, 1975)

North Carolina coastal public officials' perceptions of water quality problems in connection with recreational land development are summarized in Table 3-1. Three-fourths of the officials knew of situations where water and sewer service was needed and not available and over two-thirds were aware of septic tank failures within recreational land development projects. Forty-four percent reported that shellfish beds within their jurisdictions had been closed due to pollution from septic tanks. About a quarter cited instances of

TABLE 3-1

WATER QUALITY PROBLEMS RESULTING FROM
RECREATIONAL LAND DEVELOPMENT IN THE COASTAL REGION

Problem	Percent of Officials Interviewed Who: (N = 146) Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem Will Be[b] Serious	Not Serious	Not a Problem
1. Water and sewer not available and needed	76	33	32	35
2. Septic tank failures	67	35	34	31
3. Pollution of shellfish beds from septic tanks	44	16	23	61
4. Pollution of wells or groundwater from septic tanks	26	18	30	52
5. Pollution of finger canals from septic tanks	25	7	22	70
6. Eutrophication of tidal creeks due to increased nutrients from septic tanks	23	8	29	62
7. Package treatment plant failures or overloading	15	7	21	72

[a] QUESTION: In this next section, I will ask you about your knowledge of specific problem situations. . . . What about _____? Do you know of any cases of _____ in leisure home or recreational land development projects? Where did that occur?

[b] QUESTION: Now, I would like you to estimate how serious each of these problems is likely to become over the next ten years. Please indicate for each problem (hand respondent sheet A) whether you think it will be a serious problem, a problem, but not serious, or will not be a problem. What about . . . .

pollution of wells or groundwater from septic tanks in recreational subdivisions, pollution of finger canals, and eutrophication of tidal creeks due to increased nutrients from septic tanks. Clearly, coastal officials are aware of the potential water quality impacts of development. Large numbers know of specific instances of a variety of development-induced water quality problems.

A majority of the officials interviewed felt that the absence of water and sewer service and septic tank failures would continue to be problems over the next ten years, though only about a third rated these potential problems as serious. In addition, in some instances officials were more likely to be concerned about future impacts than to be aware of current problems. For example, although 26 percent knew of specific instances of pollution of wells or groundwater from septic tanks, 48 percent thought that this would be a problem (18 percent serious, 30 percent not serious) over the coming ten years. Similarly, 23 percent knew of instances of eutrophication of tidal creeks due to septic tanks, but 37 percent thought this would be a problem in the future, and 15 percent knew of package treatment plant failures, but 28 percent were concerned over future package plant failures within their jurisdictions.

Water Supply Problems

Recreational land development projects in the coastal zone were more likely to include a central water system than to install or have access to a sewerage system, but in many instances water systems are not available and residents must rely on individual wells. Concerns have been voiced about both the supply and quality of groundwater available to recreational subdivisions. According to Pilkey, Neal, and Pilkey (1978, pp. 62-63), for example, "One of the more significant hazards to barrier-island living is contaminated water. Although it has not yet caused an epidemic, its potential to do so threatens much of the developed coast." They have also noted that because the lens of

fresh water used for water supply by individual on-site systems overlies salt water, if too many wells are dug, the groundwater table will drop and saltwater intrusion may occur.

To date, as Table 3-2 suggests, public officials tend to be aware of instances where public water systems are needed and are not available to recreational land development projects. However, few officials perceive other water supply problems. Officials expressed some concern about excessive pumping of groundwater and saltwater intrusion (about a third thought they might become problems over the next ten years), but in general it seems that with the exception of the perceived need for more central systems, water supply per se is not perceived as a major issue in the coastal zone.

Shoreline, Dune, and Other Erosion Problems

Erosion is a natural process that was not considered to be a problem until structures encroached on the shoreline. However, because the dune-beach-bar system is highly sensitive to change, construction near the shoreline can easily disrupt the natural balance of sand supply, beach shape, wave energy, and sea level rise and result in erosion of the shoreline and loss of the beach. (Pilkey, Neal, and Pilkey, 1978; Brower, Frankenberg, and Parker, 1976) As noted by the Corps of Engineers,

> The desire of visitors, residents, and industries to find accommodations as close to the ocean as possible has resulted in man's encroachment on the sea . . . In their eagerness to be as close as possible to the water, developers and property owners often forget that land comes and goes, and that land which nature provides at one time may later be reclaimed by the sea . . . This type of encroachment has resulted in great monetary losses due to storm damage and ever-increasing costs of protection. (Department of the Army, Corps of Engineers, 1971, p. 26)

Unfortunately, efforts to mitigate erosion problems often exacerbate them further. For example, ". . . construction of barrier dunes, breakwaters, and bulkheads divert wave energies along the shore rather than inland, preventing

TABLE 3-2

WATER SUPPLY PROBLEMS RESULTING FROM
RECREATIONAL LAND DEVELOPMENT IN THE COASTAL REGION

Problem	Percent of Officials Interviewed Who: (N = 146)			
	Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem will Be[b]		
		Serious	Not Serious	Not a Problem
1. Water and sewer not available and needed	76	33	32	35
2. Groundwater shortage due to excessive pumping	23	12	21	67
3. Salt water intrusion due to excessive pumping	17	9	17	74
4. Reduced holding capacity of fresh water aquifer due to construction and paving	10	3	9	88
5. Lower water table, increased salinity, vegetation change due to drainage canals	6	1	12	87
6. Salt water intrusion due to dredging too close to wells	2	1	8	91

[a] See footnote a, Table 3-1.

[b] See footnote b, Table 3-1.

deposition of sand and creating long-shore currents which erode both beach and shoreline, as seen at Miami Beach and the North Carolina outer banks." (American Society of Planning Officials, 1976, p. 52; also see Resource Planning Section, Office of Planning and Research, Georgia Department of Natural Resources, 1975)

According to the Corps of Engineers (1973), 15 percent of the coast is subject to critical erosion. Public officials in the North Carolina coastal region could often point to examples of what Pilkey and his associates have referred to as the "New Jerseyization" of the North Carolina coast. (Pilkey, Neal and Pilkey, 1978, p. 1) As shown in Table 3-3, 62 percent were aware of instances of dune erosion due to a lack of protective access ramps; 51 percent pointed to instances of shoreline erosion due to the failure of groins and seawalls; and over a third were aware of primary dune destruction due to recreation and leisure home construction and of road overwash, salt intrusion, and erosion due to roads constructed perpendicular to the oceanfront. However, in most cases a lower proportion of officials than was currently aware of a problem felt it would continue over the next ten years. In part, this may reflect officials' beliefs that current state and local coastal management programs will be effective in preventing unwise development along the oceanfront, and, in part, their hope that current public education efforts will alert developers and recreationists to proper development practices that minimize the potential for erosion.

Wetlands and Dredging Problems

Once considered next to useless, there is now growing appreciation of the economic and other values of wetlands. In particular, it has been found that salt marshes are an important habitat for commercially valuable fish and shellfish, which depend on coastal estuaries and their associated wetlands for food

TABLE 3-3

SHORELINE, DUNE, AND OTHER EROSION PROBLEMS RESULTING FROM RECREATIONAL LAND DEVELOPMENT IN THE COASTAL REGION

Problem	Percent of Officials Interviewed Who: (N = 146)			
	Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem Will Be[b]		
		Serious	Not Serious	Not a Problem
1. Dune erosion due to lack of protective access ramps	62	15	19	66
2. Shoreline erosion due to failure of groins and seawalls	51	16	27	58
3. Primary dune destruction due to recreation and leisure home construction	37	5	8	87
4. Road overwash, salt intrusion, erosion due to roads constructed perpendicular to oceanfront	37	10	20	70
5. Erosion of shorefront property due to construction of nearby seawalls, groins, and bulkheads	29	8	27	65
6. Relic dune reactivation due to cutting of vegetation	27	8	13	79
7. Road washouts due to erosion	25	7	26	67
8. Vegetation death and erosion due to thinning of protective cover	17	6	22	72

[a] See footnote a, Table 3-1.

[b] See footnote b, Table 3-1.

sources, spawning grounds, and for nurseries for their young. (Horowitz, 1978, p. 30) Marshes also reduce the adverse effects of sewage, protect adjacent areas from flood damages, protect upland areas from erosion, and provide recreational opportunities, such as bird watching. (Brower, Frankenberg, and Parker, 1976, p. 92; also see Kusler and Montanari, 1978) These values of wetlands are usually lost when coastal marshes are ditched and drained or bulkheaded and filled as a prelude to recreational land development.

Table 3-4 summarizes coastal public officials' perceptions of wetlands problems associated with development. The only problem perceived by more than a quarter of the respondents was mosquito breeding on dredge spoils. Less than 15 percent were aware of instances where recreational land development had destroyed wetlands through dredging, dredging without necessary permits, or of reductions in fish and shellfish populations from dredging. Reflecting the apparently effective state and federal regulations of dredging in coastal wetlands, few officials felt that any of these potential problems would occur over the coming ten years.

Hurricane and Flooding Problems

The principal natural hazards in the North Carolina coastal zone are hurricanes, flooding, and, as discussed above, coastal erosion. Of these hazards, hurricanes are clearly the most serious. (White, et al., 1976, p. IV-64) Pilkey, Neal, and Pilkey (1978, pp. 11-12) report, "Records indicate that North Carolina has a major hurricane on an average of every two to three years . . . . Hurricane Hazel of October 15, 1954, the most damaging of all hurricanes to strike Wrightsville Beach, destroyed 89 buildings and damaged 530; only 20 escaped intact." Adding to the hurricane hazard is the fact that few persons have experienced a major hurricane, since a majority of coastal resort and second home development has occurred since the last major storm struck the state.

TABLE 3-4

WETLANDS PROBLEMS RESULTING FROM
RECREATIONAL LAND DEVELOPMENT IN THE COASTAL REGION

Problem	Percent of Officials Interviewed Who: (N = 146)			
	Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem Will Be[b]		
		Serious	Not Serious	Not a Problem
1. Mosquito breeding on dredge spoils	33	8	21	71
2. Destruction of wetlands due to dredging	13	4	15	81
3. Dredging without necessary permits	12	1	12	87
4. Reduction in fish and shellfish populations from dredging	9	2	12	86

[a] See footnote a, Table 3-1.

[b] See footnote b, Table 3-1.

(See Herbert and Taylor, 1975.)

A number of methods have been proposed as means of mitigating losses associated with hurricanes and coastal storms. One of the most promising is modification in building design and construction so that structures can withstand specified intensities of storm surge, wave action, and wind. In addition, since mobile homes are easily overturned or blown to new locations by strong winds, anchoring to withstand specified wind loads is now required by the state building code. Public officials' perceptions of the potential for property loss because of insufficient building design and construction practices and inadequate mobile home tie down are summarized in Table 3-5. Possibly

TABLE 3-5

NATURAL HAZARDS PROBLEMS RESULTING FROM
RECREATIONAL LAND DEVELOPMENT IN THE COASTAL REGION

Problem	Percent of Officials Interviewed Who: (N = 146) Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem Will Be[b] Serious	Not Serious	Not a Problem
1. Potential property damage because of inadequate mobile home tie down and poor mobile home location	43	8	25	67
2. Potential property loss due to inadequate residential construction practices	38	5	24	71

[a] See footnote a, Table 3-1.

[b] See footnote b, Table 3-1.

reflecting the lack of recent hurricane experience on the coast, less than a majority were aware of either type of problem. Less than a third thought that the problems would exist over the next ten years. Local officials apparently feel that building and construction practices mandated by the National Flood Insurance Program and state building code are and will be effective in mitigating damages from hurricanes and coastal storms.

Recreation and Public Access Problems

Although recreational land development creates opportunities for recreation and access to the out-of-doors, it can also lead to increased congestion and to the foreclosure of recreational opportunities for the general public. (American Society of Planning Officials, 1976, pp. 84-85) In the coastal

region the questions of preemption of natural recreational areas by development and limitations or outright denial of beach access have been of particular concern to a number of observers. One recent report states, "While in no sense a new problem, it has been in the last decade that the demand for beach recreation and the supply of beach areas available for public recreation have reached such an imbalance as to create crisis situations in many communities." (Owens and Brower, 1976, p. 1; also see Brower, et al., 1978) In addition, the quality of recreational opportunities may be diminished by crowding of facilities, litter, and general destruction of the scenic quality of coastal areas. These problems were summarized over a decade ago by the President's Council on Recreation and Natural Beauty (1968, p. 175), which declared,

> Unfortunately, opportunities to know and enjoy shorelines and islands are steadily diminishing. Natural shorelines increasingly are being fenced, bulldozed, paved, and built upon. Increasingly, scenic stretches of tidelands, beaches, dunes, and seacliffs are covered with shacks and chalets, hamburger emporiums and parking lots, highways and billboards, power plants and even oil derricks.

As shown in Table 3-6, public officials were highly aware of a variety of recreation and public access problems in the coastal zone. Among those cited by a majority were roadside litter (70 percent were aware of this problem), inadequate parking for beach access (67 percent), traffic congestion (63 percent), and conflict between private property owners and persons using their land for access to the beach (55 percent). In each case, a majority of the officials also thought that the problem would continue over the next ten years, with a third indicating that traffic congestion and inadequate parking for beach access would be serious problems.

In summary, recreational land development has the potential of producing a number of adverse water resource and environmental problems in coastal settings. Those most likely to be recognized by local officials in the North

TABLE 3-6

RECREATION AND PUBLIC ACCESS PROBLEMS RESULTING FROM RECREATIONAL LAND DEVELOPMENT IN THE COASTAL REGION

Problem	Percent of Officials Interviewed Who: (N = 146) Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem Will Be[b] Serious	Not Serious	Not a Problem
1. Roadside litter	70	24	48	28
2. Inadequate parking for beach access	67	33	31	36
3. Traffic congestion	63	32	37	31
4. Conflict between private property owners and persons using their land for access to the beach	55	20	39	41
5. Overcrowding of parks	39	17	27	56
6. Inadequate access to waterfront from nonwaterfront lots	36	11	23	67

[a] See footnote a, Table 3-1.

[b] See footnote b, Table 3-1.

Carolina coastal zone include septic tank failures and resulting pollution problems, sand dune and shoreline erosion, roadside litter, inadequate beach access, and traffic congestion, all of which were mentioned by over half of the officials interviewed for this research. Potential problems that are apparently under control, or are at least much less likely to be observed by local officials, include water supply issues, destruction of wetlands, and potential property losses from hurricanes and coastal storms because of inadequate construction practices.

Impacts in the Mountain Region

The mountain region of North Carolina, no less than the coast, is extremely fragile in terms of its capacity for recreational and other types of land development. The primary environmental constraints in the mountains include the preponderance of steep slopes in the region, highly erosive soil that is often unstable and frequently shallow, and the high potential for flash floods in narrow valleys. In combination, these conditions, ". . . make much of the region either unsuitable or undesirable for development." (Georgia Department of Natural Resources, et al., 1974, p. 29) Water resource and other environmental problems examined in the mountain region included: (1) water quality problems; (2) erosion and sedimentation problems; (3) natural hazards problems; (4) water supply problems; and (5) problems associated with the destruction of scenic areas, loss of wildlife habitat, and air pollution. As in the preceding section, the discussion focuses on public officials' perceptions of the incidence of these problems in relation to recreational land development and their prognoses regarding the persistence of problems over the coming ten years.

Water Quality Problems

Shallow soils and steep slopes create the potential for malfunctioning of septic tank systems, which are the predominate method of sewage disposal in recreational subdivisions in the mountains. The North Carolina Division of Environmental Management (1979b) has examined this problem, noting,

> Shallow soils over impervious layers of rock, clay, or mineral deposits allow lateral movement of inadequately treated wastewater. Shallow soils over highly permeable or fractured rock result in partially treated wastewater reaching rock fractures through which it may travel great distances. Excessive slopes causes hydraulic overloading on the downhill sections of the drainfield and creates wastewater breakouts at the surface. Unsuitable site conditions and increasing densities of septic tank systems create a steadily increasing potential for pollution of surface water and groundwater and for creation of public health problems.

Adverse consequences of septic tanks installed in poor locations have been observed by the Great Smokies Regional Planning Team (1977, pp. 2-13). The team reported, "Some of the most serious transgressions can be found on lands adjacent to the Region's lakes . . . and presents the danger of direct pollution of the water resource as a result of poor development practices and improper use of septic tanks."

Public officials' perceptions of water quality problems associated with recreational land development are summarized in Table 3-7. A majority knew of specific instances of septic tank failures in recreational subdivisions and a majority thought that the problem would continue over the next ten years, although only 9 percent thought that it would be serious. Almost a third were aware of cases of pollution of wells or groundwater from malfunctioning septic tanks, and almost half (46 percent) thought this would be a problem in the future. On the other hand, few officials were aware of package treatment plant failures and only about one in five thought package plants might be a problem in the future.

Erosion and Sedimentation Problems

Nationwide, erosion and sedimentation pollution are one of the most common environmental problems associated with recreational land development. (American Society of Planning Officials, 1976, p. 51) In western North Carolina, two characteristics combine to create the potential for severe erosion and sedimentation problems from development. First, as noted above, much of the region consists of steep slopes with highly erosive soils. In Watauga County, for example, slopes with gradients of 30 percent or more comprise three-fourths of the county land area (87 percent consists of slopes of 15 percent or more). As a result, erosion damage has already occurred on 44 percent of the land in the in the county. (Godschalk, Parker, and Roe, 1975) In the Piedmont, it has

TABLE 3-7

WATER RESOURCE PROBLEMS RESULTING FROM
RECREATIONAL LAND DEVELOPMENT IN THE MOUNTAIN REGION

Problem	Percent of Officials Interviewed Who: (N = 74) Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem Will Be[b] Serious	Not Serious	Not a Problem
Water Quality Problems				
1. Septic tank failures	51	9	46	45
2. Pollution of wells or groundwater from septic tanks	30	8	38	54
3. Package treatment plant failures	12	1	18	81
Erosion and Sedimentation				
1. Soil erosion during road and other construction activity	81	27	43	30
2. Road washouts and gullying due to construction on steep slopes	69	21	45	34
3. Stream or lake sedimentation and tu turbidity from sediment originating in subdivisions	53	12	41	47
4. Continuing erosion because of inadequate drainage systems	42	16	41	43
5. Bank erosion and channel scouring due to increased stormwater runoff from subdivisions	42	9	42	49

TABLE 3-7 - continued

Problem	Percent of Officials Interviewed Who: (N = 146) Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem Will Be[b] Serious	Not Serious	Not a Problem
Natural Hazards				
1. Landslides or mudflows from construction on steep slopes and poor soils	39	7	43	50
2. Flooding of lots and homes	37	8	28	64
3. Increased flood frequencies in areas downstream from subdivisions	28	10	28	62
Water Supply				
1. Shortages of groundwater/deeper well depths due to excessive pumping of groundwater	23	5	22	73

[a] See footnote a, Table 3-1.

[b] See footnote b, Table 3-1.

been found that up to five times more sediment delivery is generated from construction on steeper Piedmont soils than similar construction on less steep areas. (York and Herb, 1976, pp. 2-52-54) Second, the mountain region contains some 4,500 miles of trout streams which are very susceptible to damage from sediment. (West, 1977) As Duda has observed,

> The sediment problem is not just related to the filling up of impoundments, the clogging of water purification filters, or the aesthetically displeasing view of muddy water. The real problem is that sediment has an insidious effect on

> aquatic life. It limits algae production, which is the building block of fish production; it clogs gills of fish and fish food organisms; but more importantly it severely alters fish habitat. Desirable fish fail to reproduce.

Duda went on to note that sediment appears to be causing severe biological problems in many mountain streams. In fact, according to the North Carolina Division of Environmental Management (1979b, p. 6), "In the past, sediment from road construction has decimated stream biology in western North Carolina."

Maintenance of high quality streams is a major concern of persons involved in natural resources management in the mountain region. In a survey of 231 such individuals and 42 extension specialists in 1977, the Southern Appalachian Research-Resource Management Cooperative (1977, p. 7) found,

> . . . it is apparent that the subject of greatest concern is MAINTENANCE OF HIGH QUALITY STREAMS. Clear streams are critical for domestic and industrial uses and for maintenance of suitable fish habitats. The most frequently mentioned causes for reductions in stream quality are waste disposal from municipal, industrial and residential sources, and increased surface runoff from new construction activities.

Public officials in western North Carolina apparently share these concerns. As shown in Table 3-7, soil erosion during road and other construction activity was the most frequently recognized (by 81 percent of the officials) problem in recreational land development. In addition, 69 percent of the officials knew of instances of road washouts and gullying due to construction on steep slopes, and 53 percent knew of stream or lake sedimentation and turbidity due to sediment originating in subdivisions. Forty-two percent were aware of continuing erosion because of inadequate drainage systems and also bank erosion and channel scouring due to increased stormwater runoff from subdivisions. In most cases, officials felt these problems would likely continue over the coming ten years.

Natural Hazards Problems

Two natural hazards are of particular concern in the mountain region: landslides and flooding. With respect to landslide potential, the Great

Smokies Regional Planning Team (1977, pp. 2-3, 2-6) noted, "All of the soils of the Region are considered basically unstable, particularly on steep slopes, where landslides are common . . . . Development on unstable rocks and soils can cause erosion, health problems, and slides." In its nationwide survey of second home development, the American Society of Planning Officials (1976, p. 52) found, "Second home development along creek and river floodplains is widespread, and periodic flooding seems almost an accepted event by some owners." In western North Carolina, the susceptibility of the region to severe flood damages was again demonstrated by natural events in November 1977, when flooding throughout the mountaints resulted in the loss of 13 lives, 70 injuries, and 11,000 persons left temporarily homeless. Property losses included the destruction of 384 homes, more than 100 bridges, and 389 miles of highway. (Stewart, Heath, and Morris, 1978)

Although not as widely perceived as erosion and sedimentation pollution problems, instances of landslides and flooding in connection with recreational land development are known to a sizable proportion of public officials in the mountain region. For example, 39 percent were aware of landslides or mudflows from construction on steep slopes and poor soils, 37 percent knew of lots and homes in recreational subdivisions that had been flooded, and 28 percent felt that increased flood frequencies were being experienced in areas downstream from subdivisions. See Table 3-7. Again, problems were often seen as persisting into the future, although few officials felt that they would be serious.

Water Supply Problems

Potential water supply problems as a consequence of recreational land development were noted above in the discussion of environmental problems in the coastal region. As with the coast, few public officials in the mountain region felt that shortages of groundwater or deeper wells were being required

because of excessive pumping of groundwater in recreational subdivisions. Only about a quarter thought that groundwater shortages would become a problem over the next ten years. See Table 3-7.

Other Environmental Problems

Public officials' perceptions of other environmental problems that have occurred within or as a result of recreational land development are summarized in Table 3-8. The two most common were increased litter along roads leading to recreational subdivisions (noted by 34 percent of the officials) and the destruction of unique views and scenic vistas (noted by 32 percent). Slightly higher proportions of the officials felt that each problem would continue in the future. Although destruction of the habitats of rare or endangered plants and animals and air pollution are also potential impacts from recreational land development (see Georgia Mountains Planning and Development Commission, 1974; American Society of Planning Officials, 1976), neither problem had been observed by many public officials in the North Carolina mountain region. However, almost a third of the officials were concerned that the loss of wildlife habitat could become a problem in the future.

In summary, the major environmental problems that mountain officials tend to perceive from recreational land development are: first, soil erosion during road construction and later road washouts and other erosion problems from construction on steep slopes; second, stream sedimentation; third, septic tank failures; fourth, landslides; and fifth, flooding. Problems that are occurring infrequently or at least are infrequently perceived by public officials include overpumping of groundwater, destruction of wildlife habitats, and air pollution from increased automobile traffic.

TABLE 3-8

OTHER ENVIRONMENTAL PROBLEMS RESULTING FROM RECREATIONAL LAND DEVELOPMENT IN THE MOUNTAIN REGION

Problem	Percent of Officials Interviewed Who: (N = 146) Are Aware of Problem in Jurisdiction[a]	Believe in Next 10 Years Problem Will Be[b] Serious	Not Serious	Not a Problem
1. Increased roadside litter along roads leading to subdivisions	34	1	39	60
2. Destruction of unique views and scenic vistas	32	9	30	61
3. Destruction of rare or endangered plants or animal habitats	16	4	26	70
4. Air pollution from increased automobile traffic	12	1	17	82

[a] See footnote a, Table 3-1.

[b] See footnote b, Table 3-1.

Intensity of Development and Distribution of Impacts

With more recreational land development in a county it was expected that adverse impacts would be larger and more widespread, and therefore that they would be much more likely to be observed by local public officials. In general, this expectation is confirmed by the data in Tables 3-9 and 3-10, which summarize the relationships between perceptions of problems and the extent of recreational land development in coastal and mountain jurisdictions.

Coastal jurisdictions were divided into four categories: (1) coastal resort towns and counties with (2) high (5,000 or more recreational lots), (3)

medium (2,000-4,999 lots), or (4) low (less than 2,000 lots) amounts of recreational development. Counties within each category are listed in Table 2-1 in the preceding chapter. With few exceptions, officials serving the nine coastal counties with a low amount of recreational land development were least likely to perceive each of the environmental problems enumerated in Table 3-9. The exceptions were instances when few officials of the resort towns were aware of particular problems, such as septic tank failures, the need for water and sewer service and the potential for hurricane damage because of inadequate construction practices. Town officials' lack of awareness of environmental problems probably reflects both the developed character of these communities and resultant lack of natural environmental values, and also officials' reluctance to publicly air problems which could threaten the resort business from which many of them derived their livelihoods.

In eleven instances, differences in public officials' perceptions of problems among groups of counties were statistically significant. In the cases of water quality, erosion, and natural hazards problems, officials from the counties with a high or medium amount of development were usually much more likely to perceive problems than officials from those counties with little recreational land development or officials from the coastal resort towns. In the case of recreation and public access problems, however, officials from the counties with a high amount of recreational land development and from the resort towns--both of which were more likely to contain ocean beach recreation sites--were those most likely to perceive problems from recreational land development.

Among the mountain counties (see Table 3-10), officials from the high development counties were significantly more likely to perceive problems associated with stream and lake sedimentation and turbidity from sediment originating in subdivisions than were officials from counties with a medium or, in particular, a low amount of recreational land development. In other cases,

TABLE 3-9

GEOGRAPHIC DISTRIBUTION OF MAJOR COASTAL WATER RESOURCE PROBLEMS RESULTING FROM RECREATIONAL LAND DEVELOPMENT[a]

Problem	Percent of Officials Who Perceived Problem			
		Amount of Recreational Land Development in County		
	Resort Towns[b]	High[c]	Medium[d]	Low[e]
Water Quality Problems				
1. Water and sewer not available and needed	65	86	83	76
2. Septic tank failures*	33	81	92	76
3. Pollution of shellfish beds from septic tanks*	31	65	60	29
Erosion Problems				
1. Dune erosion due to lack of protected access ramps	56	76	82	40
2. Shoreline erosion due to failure of groins and seawalls*	43	57	76	34
3. Primary dune destruction due to recreation and leisure home construction*	29	48	73	10
4. Road overwash, salt intrusion, erosion due to roads constructed perpendicular to oceanfront*	38	40	56	14
5. Relic dune reactivation due to cutting of vegetation*	20	50	33	11
6. Road washouts due to erosion*	20	52	26	14
Natural Hazards Problems				
1. Potential property damage because of inadequate mobile home tiedown and poor mobile home location*	14	67	50	49
2. Potential property loss due to inadequate residential construction practices*	24	67	39	38

TABLE 3-9 - continued

Problem	Percent of Officials Who Perceived Problem			
	Resort Towns[b]	Amount of Recreational Land Development in County		
		High[c]	Medium[d]	Low
Recreation and Public Access Problems				
1. Roadside litter*	85	91	58	52
2. Inadequate parking for beach access	70	81	67	55
3. Traffic congestion*	87	86	43	41
4. Conflict between private property owners and persons using their land for access to beach*	74	86	41	30
5. Overcrowding of parks*	28	72	36	30
6. Inadequate access to waterfront from nonwaterfront lots*	33	52	51	17
Dredging Problems				
1. Mosquito breeding on dredge spoils	29	50	39	23

* Difference among groups of counties statistically significant at .05 level of confidence.

[a] Major problems are defined as those problems recognized by 50 percent or more of the officials within any of the land development categories (high, medium, low amount of development in county, resort town).

[b] Officials from incorporated coastal resort communities. N = 46.

[c] Officials from coastal counties with an estimated 5,000 or more recreational lots in 1976 (Brunswick, Carteret, Dare, New Hanover). N = 16.

[d] Officials from coastal counties with an estimated 2-4,999 estimated recreational lots in 1976 (Beaufort, Bertie, Chowan, Onslow, Pamlico, Pasquotank, Pender). N = 42.

[e] Officials from coastal counties with an estimate of less than 2,000 recreational lots in 1976 (Camden, Craven, Currituck, Gates, Hertford, Hyde, Perqui Perquimans, Tyrrell, Washington). N = 42.

TABLE 3-10

GEOGRAPHIC DISTRIBUTION OF MAJOR MOUNTAIN WATER RESOURCE PROBLEMS RESULTING FROM RECREATIONAL LAND DEVELOPMENT[a]

Problem	Percent of Officials Who Perceived Problem by Amount of Recreational Land Development		
	High[b]	Medium[c]	Low[d]
1. Soil erosion during road and other construction activity*	85	58	91
2. Road washouts and gullying due to construction on steep slopes	72	50	81
3. Stream or lake sedimentation and turbidity from sediment originating in subdivisions*	62	58	24
4. Septic tank failures	55	33	48
5. Landslides or mudflows from construction on steep slopes and poor soils	34	45	52

* Differences among groups of counties statistically significant at .05 level of confidence.

[a] Major problems are defined as those problems recognized by 50 percent or more of the officials within any land development category (high, medium, low).

[b] Officials from mountain counties with an estimated 5,000 or more recreational lots in 1976 (Ashe, Avery, Buncombe, Haywood, Henderson, Jackson, Macon, Transylvania, and Watauga). N = 44.

[c] Officials from mountain counties with an estimated 2-4,999 recreational lots in 1976 (Alleghany, Madison, Polk, Yancey). N = 12.

[d] Officials from mountain counties with an estimate of less than 2,000 lots in 1976 (Cherokee, Clay, Graham, Mitchell, Swain). N = 20.

however, perceptions of problems are less clearly differentiated among counties with varying amounts of recreational development. In part, this finding may reflect a more even distribution of recreational land development and fragile environments subject to adverse impacts from development in the mountain region than in the coastal zone.

Toward an Explanation of Perceived Impacts

A simple conceptual model was formulated to help explain how objective characteristics of the environment (impacts) are linked to officials' perceptions of those attributes, and as reported in the next chapter, to their evaluations of them. Based on the work of Marans and Rodgers (1975) at the University of Michigan's Survey Research Center, the model views an officials' perceptions of environmental attributes as a function of three sets of factors: (1) the social and economic milieu in which the official lives and works; (2) the objective nature of the impact; and (3) the personal values and other characteristics of the official. For example, perceptions of impacts are expected to vary with the economic status of a community. Officials in wealthier communities should be attuned to different impacts than officials of poorer communities. Perceptions should also vary with the objective nature of the impacts. Where there is more development, for example, and thus more impact of a given type, officials should be more likely to perceive it. Finally, previous research has shown that persons with different characteristics perceive the impacts of development differently. (For example, see Buttel and Flinn, 1974; Dillman and Christenson, 1972; Harry, Gale, and Hendee, 1969; Hetrick, Lieberman, and Ranish, 1974; and Pinhey and Patterson, 1976.) For instance, persons with more education have been found to be more aware of environmental problems. These examples illustrate how in the face of similar objective circumstances officials can have different perceptions of that reality. In

ascertaining how the three sets of factors--social and economic milieu, objective nature of the impact, and personal characteristics of officials--are associated with perceptions of different types of impacts, we should be in a better position to design effective programs to inform officials of the consequences of development.

Tables 3-11 and 3-12 summarize statistical analyses conducted to explain public officials' perceptions of environmental impacts. The dependent variable examined was the number of adverse environmental impacts that were perceived by an official. Because different types of impacts were identified in the coastal and mountain regions, separate analyses were performed for each region. Table 3-11 summarizes the zero-order correlation between perceived impacts and officials' personal characteristics, amount of development (as a proxy for objective impacts), and economic and social characteristics of the officials' jurisdictions. In general, the amount of development that had occurred and characteristics of the jurisdiction were more strongly associated with the number of adverse impacts perceived than were the officials' personal characteristics.

In the coastal region, public officials were more likely to perceive adverse environmental impacts of recreational land development if more development had occurred in their jurisdiction, if the jurisdiction was larger in population and if population growth between 1970 and 1975 had been larger. Each of these factors was also positively associated with perceptions of adverse environmental impacts in the mountain region. In addition, the higher the per capita income of their county, the more likely mountain region officials were to perceive adverse impacts.

In the coastal and mountain regions, officials with more years of formal education were more likely that others to be aware of adverse environmental

TABLE 3-11

ZERO-ORDER CORRELATIONS BETWEEN OFFICIALS' PERSONAL CHARACTERISTICS, ENVIRONMENTAL FACTORS AND PERCEPTION OF ENVIRONMENTAL PROBLEMS

Predictor	Correlation Coefficient with Number of Environmental Problems Perceived[a]	
	Coastal Region	Mountain Region
Personal Characteristics		
Governmental position[b]	.06	.24
Occupation[c]		
Public employee except planning	.10	.10
Business or professional except real estate	-.06	-.17
Real estate[d]	-.13	-.29
Farm	-.05	
Education	.20	.28
Length of residence in county	-.02	-.39
Length of governmental service	.001	.02
Economic and Social Factors		
Number of recreational lots, 1976	.17	.25
Population, 1975	.21	.24
Population change, 1970-1975	.18	.31
Estimated per capita income, 1974	-.01	.30

[a] Number of environmental problems that official perceived of 36 potential coastal problems (coastal region) or 16 mountain problems (mountain region). Problems are listed in earlier tables of this chapter.

[b] Coded "1," county commissioner/mayor; "2," county/town manager, "3," planner, sanitarian, soil conservationist, building inspector, planning board chairman.

[c] Coded "1," holds specified occupation; "0," other occupation.

[d] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

TABLE 3-12

MULTIPLE REGRESSION ANALYSES OF OFFICIALS' PERCEPTIONS OF ENVIRONMENTAL PROBLEMS[a]

Variable	Coastal Region Beta	Coastal Region F-Value	Mountain Region Beta	Mountain Region F-Value
Economic and Social Factors				
Population 1975	.21	6.6	--	--
Population Increase 1970-75	.26	9.3	.32	10.6
Per capita income, 1974	--	--	.26	7.0
Personal Characteristics				
Real estate occupation	-.19	4.8	--	--
Education	.16	3.8	--	--
Length of residence	--	--	-.35	13.0
Farm occupation	--	--	.20	4.5
Adjusted R for equation	.12		.31	
F-Value	5.65		9.38	
Degrees of freedom	4,133		4,71	

[a] Only variables that were statistically significant at .05 level in partial regression equations were included in final equations reported here.

impacts. In both regions officials whose primary occupation was related to real estate (realtors, developers, bankers, motel operators) and other business activities were less likely than others to perceive adverse effects. In the coastal region whether an official was elected to his position, in a management post or serving in an environmental position (planning, soil conservation, or as a sanitarian) had little effect on the perception of environmental impacts. In contrast, in the mountain region environmental officials (planners, sanitarians, and soil conservationists) were much more likely than elected officials or managers to be aware of problems. In part, both this difference and the weaker association of business occupations with problem perceptions may be due to the effects of the Coastal Area Management program, which has sensitized

coastal officials to an array of environmental problems. Lacking such a program in the mountains, officials who are not directly concerned with environmental problems as part of their occupation are much less likely to be aware of problem situations that have accompanied recreational development. The strong effect of length of residence on problem perceptions in the mountain region is an artifact of the role of the officials' governmental position. Officials with professional occupations in local government tended to be in environmentally related jobs and to have lived in the counties they served a much shorter period of time than elected and management officials.

In summary, although personal characteristics and other factors influence their perceptions, public officials' awareness of the various adverse consequences of recreational land development does seem to be associated with the actual incidence of problems. Officials in jurisdictions with more recreational and primary land development activity--those jurisdictions where more problems can be expected to have occurred--were more likely to be aware of impacts than officials serving jurisdictions with less development activity. However, the fact that officials' personal characteristics also influenced their perceptions suggests that environmental education efforts through planning, land management, and other programs can be useful in making public officials aware of the serious consequences of land development activity within their jurisdictions. Evidence of the success of such a program in the coastal region has been presented. Sharp differences in perceptions between elected officials and officials in environmentally related positions in the mountains suggests the potential value of a similar effort in that region.

Notes

1. The leading explication of the use of impact assessment in evaluating the consequences of land development activity is provided by a series of works published by the Urban Institute. See Schaenman, 1976; Keyes, 1976; and also Warner and Preston, 1974 and Herr, Slater, and Bluhm, 1978.

References

American Society of Planning Officials. 1976. Subdividing Rural America: Impacts of Recreational Lot and Second Home Development. Washington: U. S. Government Printing Office, 1976.

Barda, William and William M. Partington, Jr. 1972. "Report of Investigation of the Environmental Effects of Private Waterfront Canals." Winter Park, Fla.: Environmental Information Center of the Florida Conservation Foundation, Inc., February 1.

Bevins, Malcom I. 1972. Attitudes on Environmental Quality in Six Vermont Lakeshore Communities. Burlington, Vt.: Vermont Agricultural Experiment Station.

Brower, David, Dirk Frankenberg, and Francis Parker. 1976. Ecological Determinants of Coastal Area Management. Volume 1: An Overview. Sea Grant Publication UNC-SG-76-05. Raleigh: Sea Grant Program, University of North Carolina, April.

Brower, David J., with William Dreyfoos, Lawrence Epstein, James Pannabecker, Nancy Strowd, and David Owens. 1978. Access to the Nation's Beaches: Legal and Planning Perspectives. Sea Grant Publication UNC-SG-77-18. Raleigh: UNC Sea Grant, North Carolina State University, February.

Buttel, Frederick H. and William L. Flinn. 1974. "The Structure of Support for the Environmental Movement, 1968-1970." Rural Sociology, Vol. 39, pp. 56-69.

Dean, Jim. 1974. "Are We Losing Our Trout Streams? Wildlife in North Carolina, Vol. 38 (August), pp. 4-7.

Department of the Army, Corps of Engineers. 1971. Shore Protection Guidelines, A Part of the National Shoreline Study Conducted by the Corps of Engineers. Washington: Department of the Army, Corps of Engineers, August.

Dillman, Don A. and James A. Christenson. 1972. "The Public Value for Pollution Control," in Social Behavior, Natural Resources, and the Environment, William R. Burch, Jr., Neil H. Cheek, Jr., and Lee Taylor, eds. New York: Harper and Row, pp. 237-256.

Division of Environmental Management, North Carolina Department of Natural Resources and Community Development. 1979a. Water Quality Management Plan for Construction. Raleigh: The Division, January 1.

Division of Environmental Management, North Carolina Department of Natural Resources and Community Development. 1979b. Water Quality Management Plan for Onsite Wastewater Disposal. Raleigh: The Division, January 1.

Duda, Alfred M. 1978. "Sedimentation." Presentation at DNRCD Symposium on Sedimentation Control. Raleigh: Division of Environmental Management, North Carolina Department of Natural Resources and Community Development, March 20.

Georgia Department of Natural Resources, North Carolina Department of Administration, and South Carolina Department of Parks, Recreation, and Tourism. 1974. Southern Highlands Mountain Resources Management Plan, Volume I. Atlanta: Georgia Department of Natural Resources, June.

Georgia Mountain Area Planning and Development Commission. 1974. Survey and Analysis of the Environmental Impact of Leisure-Oriented Residential Developments. Gainesville, Ga.: The Author, January.

Godschalk, David R., Francis H. Parker, and Charles E. Roe, eds. 1975. Land Development in the North Carolina Mountains: Impact and Policy in Avery and Watauga Counties. Chapel Hill: Department of City and Regional Planning, University of North Carolina at Chapel Hill, June.

Godschalk, David R., Francis H. Parker; and Thomas R. Knoche. 1974. Carrying Capacity: A Basis for Coastal Planning? Chapel Hill: Department of City and Regional Planning, University of North Carolina at Chapel Hill, June.

Great Smokies Regional Planning Team. 1977. Guidelines for Recreation Resources Use in the Great Smokies Region. Norris, Tenn.: Division of Forestry, Fisheries and Wildlife Development, Tennessee Valley Authority, September.

Harry, Joseph, Richard P. Gale, and John Hendee. 1969. "Conservation: An Upper-Middle Class Social Movement." Journal of Leisure Research, Vol. 1 (Summer), pp. 246-254.

Herbert, Paul J. and Glen Taylor. 1975. Hurricane Experience Levels of Coastal County Populations, Texas to Maine. Washington: U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, July.

Herr, Philip, Gene Slater, and Robert Bluhm. 1978. Evaluating Development Impacts. Cambridge, Mass.: Environmental Impact Assessment Project, Laboratory of Architecture and Planning, Massachusetts Institute of Technology, Revised October.

Hetrick, Carl C., Charles J. Lieberman, and Donald R. Ranish. 1974. "Public Opinion and the Environment: Ecology, the Coastal Zone, and Public Policy." Coastal Zone Management Journal, Vol. 1, pp. 275-290.

Horowitz, Elinor Lander. 1978. Our Nation's Wetlands: An Interagency Task Force Report. Washington: U. S. Government Printing Office.

Keyes, Dale L. 1976. Land Development and the Natural Environment: Estimating Impacts. Washington: The Urban Institute.

Kusler, Jon A. and John Montanari. 1978. Proceedings of the National Wetland Protection Symposium, Reston, Virginia, June 6-8, 1977. Washington: U. S. Government Printing Office, November.

Linall, William N., Jr. and Lee Trent. 1975. "Housing Development Canals in the Coastal Zone of the Gulf of Mexico: Ecological Consequences, Regulations, and Recommendations." Marine Fisheries Review, Vol. 37, Marine Fisheries Review Paper 1163.

Marans, Robert W. and Willard Rodgers. 1975. "Toward an Understanding of Community Satisfaction," in Metropolitan America in Contemporary Perspective, Amos H. Hawley and Vincent P. Rock, eds. New York: Halstead Press Division, John Wiley & Sons, pp. 299-352.

North Carolina Marine Science Council. 1972. North Carolina's Coastal Resources. A Preliminary Planning Report for Marine and Coastal Resource Development in North Carolina. Raleigh: North Carolina Marine Science Council, Department of Administration, State of North Carolina, December 15.

Owens, David W. and David J. Brower. 1976. Public Use of Coastal Beaches. Sea Grant Publication UNC-SG-76-08. Raleigh: Sea Grant College Program, North Carolina State University, September.

Parlow, Anita. 1976. The Land Development Rag. Knoxville, Tenn.: Southern Appalachian Ministry in Higher Education, July.

Pilkey, Orrin H., Jr., William J. Neal, and Orrin H. Pilkey, Sr. 1978. From Currituck to Calabash: Living with North Carolina's Barrier Islands. Research Triangle Park, N. C.: North Carolina Science and Technology Research Center.

Pinhey, Thomas K. and Karen W. Paterson. 1976. "Environmental Concern as a Factor in Coastal Zone Development: A Study of Louisiana Citizens." Coastal Zone Management Journal, Vol. 2, pp. 297-310.

President's Council on Recreation and Natural Beauty. 1968. From Sea to Shining Sea. Washington: U. S. Government Printing Office.

Resource Planning Section, Office of Planning and Research, Georgia Department of Natural Resources. 1975. Handbook: Building in the Coastal Environment. Atlanta: The Author, June.

Resource Planning Section, Office of Planning and Research, Georgia Department of Natural Resources. 1975. The Value and Vulnerability of Coastal Resources: Background Papers for Review and Discussion. Atlanta: The Author, May.

Sabatier, Paul and Daniel Mazmanian. 1979. Toward a More Adequate Conceptualization of the Implementation Process - With Special Reference to Regulatory Policy. Davis, Calif.: Institute of Governmental Affairs.

Schaenman, Phillip S. 1976. Using an Impact Measurement System to Evaluate Land Development. Washington: The Urban Institute.

Southern Appalachian Research-Resource Management Cooperative. 1977. Priorities for Natural Resources Research: A Systems Analysis for Western North Carolina. Raleigh: The Author, May.

Stewart, James M., Ralph C. Heath, and John N. Morris. 1978. Floods in Western North Carolina, November 1977: A Lesson for the Future. Raleigh: Water Resources Research Institute of The University of North Carolina.

U. S. Army Corps of Engineers. 1973. South Atlantic Regional Inventory Report, National Shoreline Study. New York: U. S. Army Corps of Engineers.

Warner, Maurice L. and Edward Preston. 1974. A Review of Environmental Impact Assessment Methodologies. Prepared for U. S. Environmental Protection Agency. Washington: U. S. Government Printing Office.

West, Jerry L. 1977. "Analysis of Research Needs in Water Resources and Fisheries Management," in Western North Carolina Research Resource Management Conference. Proceedings. Asheville: Southeastern Forest Experiment Station, pp. 51-60.

White, Gilbert F., et al. 1976. Natural Hazards Management in Coastal Areas. Washington: Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, November.

York, T. H. and W. J. Herb. 1976. "Urban-area Sediment Yield, Effects of Construction-Site Conditions and Sediment Control Methods." Proceedings of the Third Federal Interagency Sedimentation Conference. Denver, Col.: March 22-25.

CHAPTER FOUR

ECONOMIC, FISCAL AND SOCIAL CONSEQUENCES OF DEVELOPMENT

Unlike the environmental consequences of recreational land development, which are predominantly adverse, economic, fiscal and social impacts may be either positive or negative, depending upon local circumstances and the nature of development. In the past, many local communities welcomed recreational land development in anticipation of increased employment in construction and other sectors of the economy, increased demand for goods and services, and increased tax revenues. However, evidence is accumulating to suggest that economic gains from development may be accompanied by certain costs. Environmental costs were detailed in the previous chapter. In this chapter, in addition to looking at the benefits of development, potential economic, fiscal and social costs are also examined. As in the preceding chapter, the focus is on local officials' perceptions of impacts rather than actual measures of impacts. For each type of impact studied--economic, fiscal and social--the associations of official's personal characteristics and characteristics of their jurisdictions with perceived impacts are calculated. The chapter concludes with a review of local public officials' overall evaluations of recreational land development in their jurisdictions and the factors influencing their conclusions about the net benefit or cost of development.

Economic Impacts

Althought local officials are concerned about the adverse environmental consequences of development, studies often show that economic development is a higher priority concern. (Great Smokies Regional Planning Team, 1977, p. 6-3;

also see Carter, Frost, Rubin and Sumek, 1974) The need for development is a particularly critical issue in the coastal and mountain regions of North Carolina, which have traditionally lagged behind the rest of the state, and far behind the rest of the nation, in per capita income. Previous research has established that recreation projects of various kinds can contribute to the growth of local economies. For example, summarizing experience with public recreation areas, one study concluded,

> Generally, the impact of the recreation areas studied has come in the form of higher land values near the facility, a certain amount of land speculation, stimulation of the local construction industry, increase in the quality and variety of services offered in the nearby towns, growth in retail trade, and considerable homesite as well as commercial recreation development close to the facility, particularly where a body of water was involved. (Robert R. Nathan Associates, Inc., 1966, p. 136)

In the case of private recreational land development, two types of positive economic impacts may be generated: (1) local spending by recreational land developers creates jobs and generally stimulates business activity; and (2) persons purchasing recreational property create a demand for construction employment as they build second homes and later stimulate retail business as they occupy and use those homes. The multiplier effect of recreational land development most often has been found to range from 1 to 2, but can go as high as 2.5. (American Society of Planning Officials, 1976, pp. 73-74) That is, every dollar generated by recreational land development may create up to two and one-half dollars in added income as it moves through the local economy.

In addition to its effects on employment and local income, recreational land development may lead to a general rise in property values in communities where substantial development activity is taking place. (See Glaze, 1973; Stroud, 1974; and American Society of Planning Officials, 1976.) Such land value increases have both positive and negative implications. For many existing owners, such as farmers about to retire and persons holding marginal farm

and other property, increased real estate market activity and increased land values are probably beneficial, since they provide an opportunity for persons to realize increased income from the sale of property that would not otherwise be used productively. On the other hand, increased land values and housing construction costs may create hardships for native residents of areas experiencing recreation and second home development. In a Virginia county experiencing development pressure, for example, it was noted, "If the land market of Rappahannock County continues to transfer small holdings to nonresidents and retirees at relatively high prices, agriculture will not be able to compete for land because income from agriculture cannot support high land prices." (Wunderlich, 1975, p. 22) Also, costs of housing may rise beyond the means of many rural families, a phenomenon that has been reported in Virginia, Vermont, and Oregon. (American Society of Planning Officials, 1976, p. 76) In North Carolina, land price escalation has been noted previously in relation to recreational land development in the mountain region. In Avery and Watauga counties, for example, it has been reported that land prices increased several hundred percent during the late 1960s and early 1970s (Parlow, 1976), and that the cost of housing more than doubled, so that ". . . working class families have no hope of owning their own home now." (Godschalk, Parker and Roe, 1975, p. 21)

Public officials' perceptions of economic impacts in the North Carolina coastal and mountain region are summarized in Table 4-1. Three economic effects were discussed with the officials: (1) the importance to the local economy of employment generated by recreational land development; (2) the effect of development on farming and farmers; and (3) the effect of development on land prices and native residents' ability to purchase property. Because they differed somewhat, officials' perceptions of impacts in the coastal and mountain regions are discussed in turn.

TABLE 4-1

ECONOMIC IMPACTS OF RECREATIONAL LAND DEVELOPMENT

Perceived Impacts	Percent of Officials Interviewed				
	Total	Resort Towns	Amount of Recreational Land Development[a]		
			High	Medium	Low
Coastal Region					
1. Importance to economy of construction, finance and other employment associated with land development*					
Critical	22	39	52	0	5
Important	53	50	48	70	45
Not important	25	11	0	30	50
2. Effect on farming					
Positive (market for marginal land)	24	NA	18	19	33
No effect	64	NA	65	72	52
Negative (price escalation, removal of land from production)	10	NA	17	9	15
3. Effect on land prices--property can no longer be purchased by growing number of county residents*					
Yes	71	65	91	78	59
No	29	35	9	22	41
Mountain Region					
1. Importance to economy of construction, finance and other employment associated with land development*					
Critical	16	NA	21	0	9
Important	80	NA	79	92	81
Not important	4	NA	0	8	10
2. Effect on farming					
Positive (market for marginal land)	28	NA	25	42	33
No effect	28	NA	28	33	19
Negative (price escalation, removal of land from production)	44	NA	47	25	48

TABLE 4-1 - continued

Perceived Impacts	Percent of Officials Interviewed				
	Total	Resort Towns	Amount of Recreational Land Development[a]		
			High	Medium	Low
3. Effect on land prices--property can no longer be purchased by growing number of county residents					
Yes	96	NA	94	100	100
No	4	NA	6	0	0

* Difference among groups of counties statistically significant at .05 level of confidence.

[a] For definition of development categories and number of officials in each, see Tables 3-9 and 3-10.

In the coastal area, about three-fourths of the officials thought that employment associated with recreational land development was either "critical" or "important" to the local economy. As would be expected, officials of the coastal resort towns and counties with a high (over 5,000 lots) amount of development were those most likely to rate employment from development as critically important. Where little development had occurred (less than 2,000 recreational lots), half of the officials thought that jobs associated with recreational land development were unimportant to the health of the economy. Almost two thirds of the coastal officials (64 percent) saw no effects from development on farming, although 71 percent felt that because of land price escalation, property could no longer be purchased by a growing number of county residents. Where little recreational land development had occurred, officials were more likely to feel that the effects of development on farming were positive (providing a market for marginal land) than negative (removing land from

production and pricing land out of the reach of farmers). As the amount of development in a county increased, however, the proportion of officials who saw positive effects decreased markedly. The effects of development on land price escalation were strongly related to the amount of development that occurred. In the coastal counties with a high amount of recreational land development, over nine out of ten officials thought that price escalation was making it difficult for native residents to acquire property. In comparison, less than six out of ten officials in the low development counties felt that property was being priced beyond the reach of native residents.

Economic impacts perceived by public officials in the mountain region were similar to those on the coast, but for each type of impact the effects appear to be more pronounced. In the case of jobs, for example, 96 percent of the mountain officials versus 74 percent of those in the coastal area rated employment associated with recreational land development as important or critically important to the local economy. However, none of the mountain counties were as dependent on recreational land development as the coastal resort towns and high development counties. In contrast with the coast, where officials were as likely to perceive positive effects on farming as negative effects, officials in the mountains were most likely to believe that recreational land development was hurting farmers, primarily because of land price escalation and transfer of land ownership to nonlocal parties. Mountain officials overwhelmingly felt that land price escalation was making it impossible for native residents to purchase land. Finally, in contrast with the concentration of impacts in the coastal region in resort towns and counties with a high amount of development, economic impacts in the mountains tended to be spread more evenly over the region, possibly because recreational land development in the mountains is more dispersed, even in high development counties, than on the coast, where development has clustered near ocean beaches and established resort communities. Also, because

of low buildout rates in some of the larger mountain resort projects in high development counties, potential economic benefits from recreational land development may not have been realized as of yet.

Table 4-2 summarizes statistical associations between officials' personal characteristics, characteristics of their jurisdictions and economic impact indicators. In the case of officials' perceptions of the importance of employment to the local economy, key factors in both the coast and mountains were the amount of second home and permanent land development and the officials' occupations. The more development that was taking place, the more likely officials were to view development-related jobs as important to the local economy. Officials with jobs related to business, and in particular to real estate, were more likely than others to see the development industry as important to the economy. Public employees, on the other hand, were less likely to view recreational land development as an important element in the economy of their jurisdictions. This was also true in the coastal region of officials who had held their positions for less time. Several other factors were related to officials' perceptions in the coastal region, but not in the mountains. For instance, coastal officials whose primary occupation was farming tended not to view employment related to second home development as important, persons with more education downgraded the economic importance of development and development-related employment was viewed as less important in coastal counties with higher per capita income.

In the case of development impacts on farming, the more development that had occurred in both coastal and mountain jurisdictions, the more likely officials were to view impacts as negative. Public officials in farming occupations in the coastal region were also more likely to perceive negative impacts, but this was not true of the mountain region. In the mountains, persons with more education tended to view development impacts on farming as negative, as

TABLE 4-2

ZERO-ORDER CORRELATIONS BETWEEN OFFICIALS' PERSONAL CHARACTERISTICS, ENVIRONMENTAL FACTORS AND PERCEPTIONS OF ECONOMIC IMPACTS

Predictors	Economic Impact[a]		
	Importance of Employment	Effect on Farming	Effect on Land Prices
Personal Characteristics			
Governmental position[b]	-.01 (.15)	-.19 (.08)	.06 (.16)
Occupation[c]			
Public employee except planning	(.14)(.23)	-.12 (.14)	.17 (.20)
Business of professional except real estate	(.08)(.02)	-.05 (-.08)	.02 (.07)
Real estate[d]	(-.21)(-.12)	-.08 (-.13)	-.18 (-.47)
Farmer	.23 (.04)	.40 (-.03)	-.05 (.03)
Education	.13 (-.08)	-.18 (.22)	.11 (.22)
Length of residence in county	.03 (-.11)	.03 (-.05)	.05 (-.11)
Length of governmental service	.19 (.01)	.07 (-.01)	.08 (-.16)
Environmental Factors			
Number of recreational lots, 1976	-.52 (-.41)	.09 (.14)	.03 (-.03)
Population, 1975	-.08 (-.04)	.04 (-.08)	.16 (-.44)
Population change, 1970-1975	-.52 (-.27)	.17 (.20)	.11 (.17)
Estimated per capita income, 1974	.31 (.02)	-.03 (-.03)	.19 (-.27)

[a] Figures not in parentheses refer to coastal region; figures in parentheses refer to mountain region. Signs associated with these variables are: importance of employment, "+," not important, "-," critical; effect on farming, "+," negative, "-," positive; effect on land prices, "+," land priced out of reach of residents, "-," land prices still within reach of residents.

[b] Coded "1," county commissioner/mayor; "2," county/town manager, "3," planner, sanitarian, soil conservationist, building inspector, planning board chairman.

[c] Coded "1," holds specified occupation; "0," other occupation.

[d] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

did full-time public employees; in the coastal region, on the other hand, these two groups tended to perceive impacts on farming as positive. Officials in positions related to environmental matters (planners, sanitarians, soil conservationists) working in the coastal region tended to view the effects of development on farming as positive, while officials in similar positions in the mountains viewed effects as negative. In part, these differences may stem from the location of development and relative rates of land price escalation. In the coastal region, recreational land development has often taken place in areas, such as the barrier islands, that are not considered prime agriculture land. In the mountains, on the other hand, the limited amount of developable land is often the only land suitable for agriculture. Also, because of relatively low returns to agriculture in the mountain region, agricultural operations have great difficulty in competing for land; as prices have escalated, many farmers have had little choice but to sell their property. As more land is owned by absentee owners and taken out of production, agricultural communities are further weakened.

In contrast with factors associated with perceived farm impacts, factors associated with officials' perceptions of the effects of increasing land prices were similar in the coast and mountains. Officials in environmental positions, who were full-time public employees, with more education, and/or living in counties that were experiencing greater population growth were more likely than others to believe that increasing land prices were making it more difficult for native residents to purchase property. Those most likely to believe that this was not the case and that land prices were still within reach of most residents were public officials whose primary occupations were related to real estate.

Fiscal Impacts

The fiscal impacts of recreational land development hinge on the difference between tax revenues generated by development and the costs of public services that must be provided. In this regard, it has been noted, "The critical question is whether existing facilities and services are adequate to absorb the demand by new development, and, if not, will new development generate the necessary capital to expand local facilities and services?" (American Society of Planning Officials, 1976, pp. 61-62) A related question, of course, is what services are required by recreational land development and, equally important, will local government provide them? The American Society of Planning Officials (1976) has documented a number of instances of increased demand for services stemming from second home projects, but according to a related study by the Urban Land Institute (1974), local governments are often reluctant to provide even minimal services to densely settled recreational communities. Possibly because local governments are slow in responding to increased service demands, a number of studies have shown that at least initially development produces a fiscal surplus. (See American Society of Planning Officials, 1976, p. 68.) As suggested in Chapter One, however, a number of factors--the need to repair or rebuild substandard facilities, the need for sanitary sewerage, and conversion of housing units from seasonal to permanent occupancy--can turn a fiscal surplus into a fiscal deficit.

Public officials' perceptions of increased service demands occasioned by recreational land development within their jurisdictions and their assessments of the net fiscal surplus or deficit from development are summarized in Table 4-3. In the coastal region, a majority of the public officials thought that development had resulted in increasing demands for eight services, including solid waste collection and disposal, planning and land use regulation, police

TABLE 4-3

FISCAL IMPACTS OF RECREATIONAL LAND DEVELOPMENT

	Percent of Officials Interviewed[a]				
			Amount of Recreational Land Development		
	Total	Resort Towns	High	Medium	Low
Coastal Region					
1. Demand for public service has increased due to recreational land development:					
a. Solid waste collection and disposal*	81	83	100	83	67
b. Planning and land use regulation	74	80	84	68	67
c. Police protection*	73	87	90	70	51
d. Building, plumbing, electrical inspection*	65	80	80	59	45
e. Fire protection*	64	74	79	62	48
f. Parks and recreation*	59	67	75	61	39
g. Mosquito control*	56	64	80	54	39
h. Emergency health care and treatment*	56	60	80	60	38
i. Health care for older residents*	45	36	70	54	36
j. Welfare service due to seasonal unemployment*	18	11	53	12	14
2. Property tax revenues from recreational land development have:					
Exceeded service costs	23	18	20	37	21
Met service costs	56	64	45	41	62
Fallen short of service costs	21	18	35	22	17
Mountain Region					
1. Demand for public services has increased due to recreational land development:					
a. Solid waste collection and disposal*	88	NA	91	83	76
b. Building, plumbing, electrical inspection*	81	NA	87	83	67
c. Fire protection*	80	NA	91	50	67
d. Police protection*	78	NA	85	67	62
e. Parks and recreation*	70	NA	77	42	62

TABLE 4-3 - continued

	Percent of Officials Interviewed				
			Amount of Recreational Land Development		
	Total	Resort Towns	High	Medium	Low
f. Emergency health care and treatment	69	NA	75	58	62
g. Planning and land use regulation*	68	NA	79	46	43
h. Health care for older residents	60	NA	57	58	62
i. Welfare services due to seasonal unemployment	43	NA	45	8	55
2. Property tax revenues from recreational land development have:					
Exceeded service costs	26	NA	30	18	19
Met service costs	47	NA	46	46	48
Fallen short of service costs	27	NA	24	36	33

* Difference between groups of counties statistically significant at .05 level of confidence.

NA = Not applicable.

[a] For definition of development categories and number of officials in each, see Tables 3-9 and 3-10.

protection, building, plumbing and electrical inspection, fire protection, parks and recreation, mosquito control, and emergency health care and treatment. In addition, as reported in Chapter Three, coastal officials often felt that water and sewer service was needed, but not available, in recreational land development projects. The more development that had occurred within a county, the more likely demands for public services were to have increased. Within the high development coastal counties, over three-fourths of the officials tied increased service demands to recreational land development occurring within their jurisdictions. A majority of the officials in the mountain region

also saw demands rising for eight services as a result of recreational land development. Solid waste collection and disposal ranked first, followed by increased demand for building, plumbing and electrical inspection, fire protection, police protection, parks and recreation, emergency health care and treatment, planning and land use regulation, and health care for older residents. Again, the more development that was occurring in a jurisdiction, the more likely officials were to view demands for public services as rising.

Public officials in both the coastal and mountain jurisdictions tended to differ sharply as to whether recreational land development was paying its own way. In the coastal region, 56 percent felt that revenues from development were meeting service costs, 23 percent thought revenues exceeded costs, while 21 percent thought that they were falling short of increased service costs. In the mountains, opinions were similarly split. Forty-seven percent of the officials reported that revenues from development were meeting costs, while 26 percent felt revenues exceeded costs and 27 percent felt that they were falling short of increased costs. Although differences among counties with varying amounts of recreational land development were not statistically significant, in the coastal region as development (and service demands) rose, officials were more and more likely to believe that increased service costs were outrunning increased revenues. However, the opposite seemed to be true in the mountains, where officials in counties with more development were more likely than others to believe that recreational projects were producing a revenue surplus for their counties. In part, this difference could stem from counties' actions in meeting increased service demands. As a result of the Coastal Area Management Act and possibly greater overall environmental awareness and concern, coastal counties have had to devote more resources to planning, land use regulation, and environmental protection than have mountain counties. In addition, the concentrated character of recreational land development in the coastal

region apparently has produced more sharply focused demands for services. Comparing high development coastal and mountain county officials' perceptions of increased service demands, for example, indicates that for eight of nine services higher proportions of coastal officials saw demand as increasing as a result of recreational land development.

Other factors associated with public officials' perceptions of fiscal impacts are summarized in Table 4-4. In addition to the amount of recreational land development in a jurisdiction, the amount of population increase from 1970 to 1975 was also strongly and positively related to increased service demands. In addition, officials who had resided in a county a longer period of time and who had more formal education were more likely to view service demands as rising. Public employees, particularly those employed in environmental positions, were less likely than others to view service demands as rising as a result of development.

In the case of fiscal surpluses or deficits from development, factors associated with officials' perceptions differed between the coast and mountains. In the coastal region, officials living in counties with larger populations and those with primary occupations in farming and who had lived in a county a longer period of time were more likely than others to believe that recreational land development was not paying its own way. In the mountain region, on the other hand, officials living in counties with smaller populations and those with more education and working as public employees were more likely than others to perceive fiscal shortfalls from development. The difficulties small mountain counties are experiencing in meeting service demands have been noted elsewhere. (Great Smokies Regional Planning Team, 1977, p. 2-11) Because development activity is more dispersed in the mountains, adverse fiscal effects may not yet be widely apparent; thus, full-time public officials and officials with more formal education and training are those most likely at this time to perceive

TABLE 4-4

ZERO-ORDER CORRELATIONS BETWEEN OFFICIALS' PERSONAL CHARACTERISTICS, ENVIRONMENTAL FACTORS AND PERCEPTIONS OF FISCAL IMPACTS

Predictors	Fiscal Impacts[a]	
	Increased Service Demand[b]	Cost/Revenue Effects
Personal Characteristics		
Governmental position[c]	-.16 (-.13)	-.14 (.02)
Occupation[d]		
Public employee except planning	-.19 (.03)	.00 (.26)
Business or professional except real estate	.09 (-.05)	-.06 (-.08)
Real estate[e]	.04 (-.11)	.02 (-.23)
Farm	.10 (.11)	.19 (-.01)
Education	.03 (.14)	-.07 (.16)
Length of residence in county	.14 (.09)	.19 (-.18)
Length of governmental service	-.08 (-.03)	.03 (-.07)
Environmental Factors		
Number of recreational lots, 1976	.18 (.43)	.11 (-.02)
Population, 1975	-.003 (-.06)	.22 (-.21)
Population change, 1970-1975	.27 (.44)	.09 (.08)
Estimated per capita income, 1974	-.19 (-.05)	.09 (-.01)

[a] Figures not in parentheses refer to coastal region; figures in parentheses to mountain region. Signs associated with these variables are: service demand, "+," more services, "-," less services; cost/revenue effects, "+," costs exceed revenues, "-," revenues exceed costs.

[b] Coded as number of services (see Table 4-3) for which official perceives increased demand due to recreational land development.

[c] Coded "1," county commissioner/mayor; "2," county/town manager; "3," planner, sanitarian, soil conservationist, building inspector, planning board chairman.

[d] Coded "1," holds specified occupation; "0," other occupation.

[e] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

that recreational land development may not be producing enough revenues to cover the costs of providing needed public services.

Social Impacts

Two types of social impacts have been found to accompany recreational land development in other regions. First, social pathologies, such as crime, drugs, and congestion, may increase sharply. (American Society of Planning Officials, 1976) Second, traditional rural cultures may change, with resultant alienation of native residents and conflicts between the natives and newcomers. These impacts are not restricted to the United States, but have been noted around the world in areas where tourist and recreational land development have been occurring. (Coppock, 1977) In the North Carolina mountains, previous studies have commented on social problems that have accompanied recreational development. For example, the Southern Appalachian Research-Resource Management Cooperative (1977, p. 5) has observed,

> Historically, these lands were divided into small farms and large timber holdings. This basic pattern has been altered in a number of ways in the last 10-15 years by developments for second-homes and recreation. The biggest change was consolidation and purchase of large tracts by out-of-state interests. These tracts, in turn, were subdivided and sold, chiefly to other out-of-state residents.

In fact, the North Carolina Public Interest Research Group documented a 26 percent rise between 1968 and 1973 in absentee ownership, with out-of-state owners increasing their land holdings in the mountain region by almost 50 percent. (Cary et al., 1975) As a result, it has been noted that persons residing in second home developments, resorts, and other recreation-oriented development, ". . . compete with local populations for use of public services, transportation networks, and private business services." (Southern Appalachian Research-Resource Management Cooperative, 1977, p. 9)

Social impacts observed by public officials in both the coastal and mountain regions of North Carolina are summarized in Table 4-5. The most frequently noted impacts--each cited by a majority of the officials in each region--were increased crime and traffic congestion. Conflicts between natives and outsiders were more likely to be observed by mountain officials (43 percent) than by officials in the coastal region (29 percent). In part this may be due to the fact that recreational land development in the mountains was more likely than development on the coast to attract persons from outside North Carolina (see Chapter Two, page 27), and, in part, to the more even distribution of second home development over the mountain region. The latter factor may be critical, since if only the high development counties are examined, it can be seen that similar proportions of coastal (50 percent) and mountain (47 percent) officials perceived conflicts between second home residents and native residents. This was also true of perceptions of crowding and overuse of public facilities, which was perceived by a higher proportion of mountain (35 percent) than coastal (20 percent) officials overall, but by similar proportions of officials in the high development counties in each region (36 percent and 35 percent, respectively).

Public officials' perceptions of adverse social impacts were strongly associated with the amount of second home and recreational land development that was occurring within their jurisdictions, but their personal characteristics had much less influence on perceptions of impacts, particularly in the coastal region. See Table 4-6. In the mountain region, public officials whose primary occupation was farming were more likely to perceive adverse social impacts, while those whose occupations were related to real estate perceived fewer impacts. In the coastal region, officials who were longer term residents of their jurisdiction were more likely to perceive adverse social impacts from development, but other personal characteristics were mostly unrelated to perceived impacts.

TABLE 4-5

SOCIAL IMPACTS OF RECREATIONAL LAND DEVELOPMENT

Perceived Impact	Percent of Officials Interviewed[a]				
	Total	Resort Towns	Amount of Recreational Land Development		
			High	Medium	Low
Coastal Region					
Social problems have increased due to recreational land development:					
a. Crimes, such as vandalism and burglary*	53	50	80	61	38
b. Traffic congestion*	57	76	95	38	36
c. Conflict between second home residents and native residents over public services and programs	29	24	50	28	26
d. Crowding and over use of existing public facilities and services	20	14	35	19	19
e. Seasonal unemployment*	9	11	30	3	2
Mountain Region					
Social problems have increased due to recreational land development:					
a. Crimes, such as vandalism and burglary*	64	NA	77	8	62
b. Traffic congestion*	54	NA	68	33	33
c. Conflict between second home residents and native residents over public services and programs	43	NA	47	42	38
d. Crowding and over use of existing public facilities and services	35	NA	36	8	43
e. Seasonal unemployment*	18	NA	23	8	5

* Differences among groups of counties statistically significant at .05 level of confidence.

[a] For definitions of development categories and number of officials in each, see Tables 3-9 and 3-10.

TABLE 4-6

ZERO-ORDER CORRELATIONS BETWEEN OFFICIALS' PERSONAL CHARACTERISTICS, ENVIRONMENTAL FACTORS AND PERCEPTIONS OF SOCIAL IMPACTS

Predictor	Number of Social Impacts Perceived[a] Coastal Region	Mountain Region
Personal Characteristics		
Governmental position[b]	-.05	.08
Occupation[c]		
Public employee except planning	-.08	.06
Business or professional except real estate	.03	-.02
Real estate[d]	-.02	-.15
Farm	.01	.26
Education	.03	.11
Length of residence in county	.14	-.00
Length of governmental service	.01	-.03
Environmental Factors		
Number of recreational lots, 1976	.22	.43
Population, 1975	.11	.05
Population change, 1970-1975	.32	.40
Estimated per capita income, 1974	-.11	-.04

[a] Dependent variable is number of five potential social impacts perceived by official. See Table 4-5.

[b] Coded "1," county commissioner/mayor; "2," county/town manager; "3," planner, sanitarian, soil conservationist, building inspector, planning board chairman.

[c] Coded "1," holds specified occupation; "0," other occupation.

[d] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

Officials' Overall Evaluation of Recreational Land Development

As the data presented in this and the preceding chapter indicate, recreational land development produces both positive and negative effects in the jurisdictions within which it is occurring. In this sense, North Carolina is not unique. Observing a similar phenomenon elsewhere, the American Society of

Planning Officials (1976, p. 88) noted, "Many local residents seem torn between a desire for the affluence growth can bring and a fear of the negative side effects, some of which seem to be the inevitable price of that growth." However, most studies of resort areas in North Carolina and elsewhere have concluded that, on balance, local people see the benefits of development as outweighing the costs. For example, Pilkey, Neal and Pilkey (1978, p. 11) have written, ". . . throughout history the coastal zone of North Carolina has been an economically poor area so that development of almost any kind tends to be welcomed because of its presumed positive economic effect." (Also see Haskell, 1976 and Godschalk, Parker and Knoche, 1974 for similar observations about coastal attitudes toward recreational land development.) After studying land development in Avery and Watauga counties in the mountains, Godschalk, Parker and Roe (1975, p. 4) concluded,

> The historical view shows that local political officials have for over a century promoted tourism and recreational development. The recreation/second home development in the 1960s and 1970s has been perceived as a modern extension of the traditional tourist commerce. The local people and their elected officials do not exhibit either fear or hostility to the "flatlander" seasonal residents.

A similar finding was reported in a study of a mountain resort project in West Virginia, where a survey of local residents indicated that over three-fourths thought that benefits of the project would outweigh any negative impacts. (Smith and Alanen, 1976) In fact, one of the few groups that has been found to consistently oppose recreational land development is the seasonal occupants of previously constructed recreational projects. In a study of attitudes toward growth in a resort area of northern Michigan, for example, Marans and Welman (1978, p. 163) found that only a third of the year-round residents they interviewed wanted to restrict growth and development in the region compared to two-thirds of the seasonal residents.

As shown in Table 4-7, public officials interviewed for the present study tended to view recreational land development as beneficial for their towns and counties, even though it has been shown that many were also aware of a number of adverse environmental, economic, fiscal and social impacts. In fact, the more development that had occurred in an official's jurisdiction, the more likely the net effects of development were to be viewed as beneficial. Where less development had taken place, officials were more likely (41 percent in the coastal region and 52 percent in the mountains) to feel that it was too early to draw any conclusions about the net benefits of recreational development. However, very few officials--only 5 percent in the coastal region and 10 percent in the mountains--rated recreational land development as not beneficial for their jurisdiction.

The reason for public officials' favorable overall evaluation of recreational land development is clearly illustrated by data summarized in Table 4-8, which reports correlation coefficients between the officials' personal characteristics, characteristics of their jurisdictions, their perceptions of various impacts and their overall evaluations. The strongest association in both the mountains and the coast was the relation between the officials' perceptions of the importance to the local economy of development-related jobs and their overall evaluations. A number of other perceived impacts were also associated with the officials' overall evaluations, but to a lesser degree. In the coastal region, officials who were aware of more environmental problems from development and who saw development as producing more demand for services were more likely to rate development as beneficial than officials who knew of fewer problems or public service impacts. Apparently these officials saw increased jobs as more important to their county than the environmental problems and service demands that also accompanied recreational land development. On the other hand, officials who felt that development had produced negative fiscal impacts

TABLE 4-7

OFFICIALS' OVERALL EVALUATIONS OF RECREATIONAL LAND DEVELOPMENT

Evaluation	Percent of Officials Interviewed				
	Total	Resort Towns	Amount of Recreational Land Development		
			High	Medium	Low
Coastal Region					
Overall, second home and recreational land development has been:*					
Beneficial for county (community)	71	91	86	65	49
Too early to say	24	7	9	32	41
Not beneficial for county (community)	5	2	5	3	10
Mountain Region					
Overall, second home and recreational land development has been:*					
Beneficial for county	62	NA	72	50	38
Too early to say	28	NA	17	50	52
Not beneficial for county	10	NA	11	0	10

* Differences among groups of counties statistically significant at .05 level of confidence.

[a] For a definition of development categories and number of officials in each, see Tables 3-9 and 3-10.

tended to also feel that on net development was not beneficial for their jurisdiction. Finally, the officials' perceptions of social impacts had little effect one way or the other on their overall evaluations of development.

Table 4-8 also summarizes the correlation between characteristics of the officials' jurisdiction and their evaluations of recreational land development. In the coastal region, officials were more likely to view recreational land development as beneficial in those counties where more land development activity was taking place and in larger counties. Reflecting the relative need for

TABLE 4-8

ZERO-ORDER CORRELATION BETWEEN OFFICIALS' PERSONAL CHARACTERISTICS, ENVIRONMENTAL FACTORS, IMPACT PERCEPTIONS AND OVERALL EVALUATION OF RECREATIONAL LAND DEVELOPMENT

Prediction	Overall Evaluation[a] Coastal Region	Mountain Region
Personal Characteristics		
Governmental position[b]	.06	.22
Occupation[c]		
Public employee except planning	.05	.20
Business professional except real estate	-.04	-.25
Real estate[d]	-.23	-.11
Farm	.28	.11
Education	.08	.09
Length of residence in county	.03	-.05
Length of governmental service	.15	-.07
Environmental Factors		
Number of recreational lots, 1976	-.34	-.23
Population, 1975	-.22	-.05
Population change, 1970-1975	-.27	-.09
Estimated per capita income, 1974	.21	-.07
Perceived Impacts		
Number of environmental problems perceived	-.17	.11
Land price escalation not a problem	-.13	.14
Increase in services demanded	-.27	-.04
Negative fiscal impact	.18	.10
Second home jobs not important	.45	.26
No effect/positive effect on farming	.22	.20
Number of social problems perceived	.03	.04

[a] Sign associated with overall evaluation is: "+," not beneficial for county or community; "-," beneficial for county or community.

[b] Coded "1," county commissioner/mayor; "2," county/town manager; "3," planner, sanitarian, soil conservationist, building inspector, planning board chairman.

[c] Coded "1," holds specified occupation; "0," other occupation.

[d] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

development, officials living in counties with lower per capita income were more likely than others to view development as beneficial for their jurisdiction. In the mountain region, officials in counties with more recreational land development were more likely to rate development positively, but county population size, population increase from 1970 to 1975, and county per capita income were not strongly associated with their overall evaluations.

In the case of the officials' personal characteristics, those whose primary occupations were related to business, and in particular to real estate, were more likely than others to rate recreational land development as beneficial. Officials whose primary occupation was farming, on the other hand, were less likely than others to see the net benefits of development. In the coastal region, officials with more years of governmental service were less likely than officials with fewer years of service to view recreational land development as beneficial, possibly because they had more experience dealing with the adverse effects of development. In the mountains, full-time public employees and those whose positions were related to environmental matters (planners, sanitarians, and soil conservationists) were least likely to feel that recreational land development had been beneficial, apparently because as noted earlier, they are closer to and more likely to be aware of the adverse environmental and fiscal effects of development in the mountains.

In summary, it seems clear that even though officials perceive a number of adverse consequences of recreational land development, their perceptions of the employment-related benefits of development overwhelm whatever qualms they may have about damage to the environment or social problems. The one factor that apparently gives officials second thoughts about the advantages of recreational land development--fiscal imbalances with service costs outrunning increased revenues--as yet has not been widely experienced. There is some evidence in high development coastal counties that officials are becoming concerned

about revenues from development falling short of service costs. To the extent that public sewerage systems are required in these counties, fiscal imbalances should become even more acute and attitudes toward development may change. For the present, however, it seems clear that limiting recreational land development is not a viable option as a strategy for mitigating adverse impacts. Strategies that have been tried in North Carolina and local officials' perceptions of their effectiveness are discussed in the following chapter.

References

American Soceity of Planning Officials. 1976. Subdividing Rural America: Impacts of Recreational Lot and Second Home Development. Washington: U. S. Government Printing Office.

Carter, Steve, Murray Frost, Claire Rubin, and Lyle Sumek. 1974. Environmental Management and Local Government. Socioeconomic Environmental Studies Series. Washington: Office of Research and Development, U. S. Environmental Protection Agency, February.

Cary, William, Molly Johnson, Meridith Golden, and Trip Van Noppen. 1975. The Impact of Recreational Development: A Study of Landownership, Recreational Development and Land Use Planning in the North Carolina Mountain Region. Durham: North Carolina Public Interest Research Group, April.

Coppock, J. T., editor. 1977. Second Homes: Curse or Blessing? Oxford: Pergamon Press.

Glaze, Freddie Max. 1973. "An Analysis of Rural Subdivision Development on Selected Reservoirs in the Trinity River Basin, Texas." Ph.D. dissertation, Texas A & M University.

Godschalk, David R., Francis H. Parker, and Charles E. Roe. 1975. Land Development in the North Carolina Mountains: Impact and Policy in Avery and Watauga Counties. Chapel Hill: Department of City and Regional Planning, June.

Gosdchalk, David R., Francis H. Parker, and Thomas R. Knoche. 1974. Carrying Capacity: A Basis for Coastal Planning? Chapel Hill: Department of City and Regional Planning, University of North Carolina at Chapel Hill, June.

Great Smokies Regional Planning Team. 1977. Guidelines for Recreation Resources Use in the Great Smokies Region. Norris, Tenn.: Division of Forestry, Fisheries and Wildlife Development, Tennessee Valley Authority, September.

Haskell, Elizabeth H. 1976. Land Use Organizations for North Carolina. Prepared for North Carolina Land Policy Council. Raleigh: The Land Policy Council Staff, Office of State Planning, North Carolina Department of Administration, March 1.

Marans, Robert W. and John D. Wellman. 1978. The Quality of Nonmetropolitan Living: Evaluations, Behaviors, and Expectations of Northern Michigan Residents. Ann Arbor: Survey Research Center, Institute for Social Research, The University of Michigan.

Parlow, Anita. 1976. The Land Development Rag: The Impact of Resort Development on Two Appalachian Counties, Watauga and Avery, in North Carolina. Knoxville: Southern Appalachian Ministry in Higher Education, July.

Pilkey, Orrin H., William J. Neal, and Orrin H. Pilkey, Sr. 1978. From Currituck to Calabash: Living with North Carolina's Barrier Islands. Research Triangle Park, N. C.: North Carolina Science and Technology Research Center.

Robert R. Nathan Associates, Inc. 1966. Potential Impact of the Delaware Water Gap National Recreation Area on Its Surrounding Communities. Washington: The Author, February.

Smith, E. Kenard and Arnold R. Alanen. 1976. "Social and Economic Considerations in Appalachian Recreational Development: A West Virginia Case Study," in Burton L. Purrington and Ole Gade, eds., Planning Frontiers in Rural America: Papers and Proceedings of the Boone Conference. Washington: Senate Committee on Agriculture and Forestry, Congress of the United States, Subcommittee on Rural Development, Committee Print, February 17.

Southern Appalachian Research-Resource Management Cooperative. 1977. Priorities for Natural Resources Research: A Systems Analysis for Western North Carolina. Raleigh: The Author, May.

Stroud, Hubert B. 1974. "Amenity Land Developments as an Element of Geographic Change: A Case Study of Cumberland County, Tennessee." Ph.D. dissertation, The University of Tennessee.

Urban Land Institute. 1974. An Assessment of the Economic and Fiscal Consequences of Second Home and Recreational Land Development. Prepared for the American Society of Planning Officials. Washington: ULI-the Urban Land Institute, April, Draft.

Wunderlich, Gene. 1975. Land Along the Blue Ridge: Ownership and Use of Land in Rappahannock County, Va. Agricultural Economic Report No. 299. Washington: Department of Agriculture, Economic Research Service, July.

CHAPTER FIVE

RECREATIONAL LAND DEVELOPMENT AND PUBLIC POLICY

The public policy challenge posed by second home and recreational land development is to maximize the positive economic benefits from development, while minimizing various adverse effects. Most adverse effects can be traced to two aspects of recreational land development: the location of development and the quality of site planning and construction. (American Society of Planning Officials, 1976, p. 97) Both the State of North Carolina and local governments have devised policies to address locational and quality considerations. In the first part of this chapter, existing state and local policies affecting recreational land development are identified and evaluated on the basis of local public officials' assessments of their effectiveness. In the second part of the chapter, a number of new policies are examined. These include expanded roles for existing institutions, new approaches to improving the quality of land development, and expansion of the state's role in regulating development. As with existing policies, local officials' were asked to evaluate possible new policies, and their evaluations are also reported.

Current Policies Affecting Recreational Land Development

Regulation of land development has traditionally been the responsibility of local government in North Carolina. The location of various land uses and intensity of development may be controlled by zoning ordinances. The quality of development and standards that are followed in the subdivision and construction process may be governed by subdivision regulations and local enforcement of the state building code. In addition, local governments may apply various

other regulations to ensure that the quality of the environment is protected during the development process. In order to protect property from flooding, floodway regulations may be adopted to control construction in flood-hazard areas. In order to minimize erosion, local governments may adopt sedimentation pollution control ordinances that meet state standards. In addition, local governments in North Carolina can adopt environmental impact statement regulations that require developers to consider and to disclose the potential impacts of their projects on the natural environment.

While local governments in North Carolina have the power to regulate land development so as to minimize adverse impacts, they have often been criticized for failing to use that power. In the mountain region, for example, the Southern Appalachian Research-Resource Cooperative (1977, p. 6) has noted, "Local governments in the North Carolina mountains have made no strong, area-wide effort to develop land or other resource management programs and policies." The Great Smokies Regional Planning Team (1977, p. 93) observed, "There apparently is considerable misunderstanding of or indifference toward resource management, land-use controls, and policies by local units of government within the Region. Recognition of the need to manage natural resources and control land uses in ways that benefit all residents is not widespread among these units of government." The North Carolina Public Interest Research Group concluded, "Effective land use planning activities by county governments in the mountain region have been meager and superficial." (Cary, et al., 1974, p. ii) In this regard, local governments in North Carolina apparently are not much different than those in other areas of the nation where recreational land development has been taking place. In 1969, Tombaugh (1970, p. 5) found, "Few local governmental agencies are equipped to plan adequately for recreational developments, nor have their been strong incentives to do so. Planning connotes

long-run solutions to problems; revenue needs are immediate." While according to the American Society of Planning Officials (1976, p. 97), ". . . the areas of the country where recreational land development pressures have been the greatest are the same areas of the country which have had the weakest development regulations." In fact, this latter study concluded, "The major negative impacts of recreational land development on local communities have resulted primarily from the total lack of or inadequacy of local land development regulations, as well as poor administration." (p. 11)

North Carolina local governments' adoption of various land use and environmental regulations in the coastal and mountain regions as of 1978 is summarized in Table 5-1. The reasons for criticism of local governments in the mountain region noted above are readily apparent. Over 70 percent of the coastal counties had adopted subdivision regulations and over a third had adopted county zoning. In coastal resort towns, zoning and subdivision regulations had been adopted almost universally. In contrast, only 33 percent of the mountain counties had adopted subdivision regulations and only 11 percent had county zoning. In spite of massive flooding in western North Carolina during 1977, only slightly more than half of the counties (55 percent) had adopted floodway regulations, although authorization for county regulation of flood-hazard areas has been available since 1971. Also, only about half of the coastal and mountain counties were enforcing the statewide building code, and far fewer had adopted local sedimentation pollution control regulations or were requiring developers to file environmental impact statements.

The reluctance of mountain counties to regulate land development and building can be traced to two factors: philosophical opposition to governmental regulation (see Hahn, 1970) and lack of financial and technical capacity to mount vigorous planning and development regulation programs. According to the

TABLE 5-1

LOCAL LAND USE AND ENVIRONMENTAL REGULATION, 1978

Regulation	Percent of Jurisdictions with Regulations: Coastal Region Resort Towns (N = 17)	Coastal Region Counties (N = 20)	Mountain Region Counties (N = 18)
Zoning ordinance	100	35	11
Subdivision regulations	88	70	33
Floodway regulations	94	30	55
Sedimentation pollution control ordinance	24	10	28
Environmental impact statement requirement	6	0	17
Building code/inspection	88	55	50

Great Smokies Regional Planning Team (1977, p. 93), the former barrier to increased local governmental intervention in the development process is slowly changing in the face of ". . . a proliferation of poorly planned or unplanned strip development, second home development, urban sprawl and other land-use conflicts. . . ." Even so, the Team concluded that a major education and information effort would be needed before environmental and land use planning processes became "an accepted part of local and regional life." In the coastal region, philosophical opposition to regulation has probably been as strong in the past as in the mountains. However, with adoption of the federal Coastal Zone Management Act in 1972 and subsequent state Coastal Area Management Act, adopted in 1974, coastal jurisdictions have had both an incentive to act--if they failed to plan for and control development, the state would step in--and financial assistance in establishing local planning and land use management programs.

Passage of the Coastal Area Management Act in 1974 reflected the State of North Carolina's strong determination to pursue a policy of balanced development and environmental protection in the coastal region. Key aspects of the act, which applies to the 20 coastal counties studied in this research, include: (1) establishment of the Coastal Resources Commission as a regional resource management agency; (2) mandatory local land use planning; (3) designation of critical coastal resource areas as "areas of environmental concern;" and (4) regulation of development within areas of environmental concern through a coordinated state-local permitting process. The designated areas of environmental concern include, ". . . near shore and estuarine waters, saltwater wetlands, beaches and primary dunes and certain other areas which together represent a narrow band, or buffer zone, around coastal waters, where regulation of nearly all uses will occur." (Office of Coastal Zone Management, 1978a, pp. 6-7) Regulation of major projects--those that require a permit from another state agency, will occupy a land and water area in excess of 20 acres or a structure on a single parcel with a ground floor areas in excess of 60,000 square feet--is handled by the Coastal Resources Commission. All other proposed development in areas of environmental concern is termed "minor" and is handled by local governmental officials designated by the Coastal Resources Commission and local governments to administer the minor permit program within their jurisdictions. Both major and minor development permits are to be denied where a proposed project would be inconsistent with state guidelines for areas of environmental concern or with local land use plans.

Outside of areas of environmental concern (termed the "second tier" for purposes of coastal area management), the state relies on coordination among a variety of existing regulations in order to protect the environment from abuse during the land development process. Existing state programs and regulations that are particularly relevant to second home and recreational land development

include: (1) septic tank regulations; (2) sedimentation pollution control regulations; and (3) dredge and fill regulations. In the first case, the North Carolina Ground Absorption Sewage Disposal Act authorizes the issuance of permits for septic tanks with a capacity under 3,000 gallons by local health departments if the proposed systems meet county health regulations and state standards. The Sedimentation Pollution Control Act of 1973 authorized a Sedimentation Pollution Control Commission within the Department of Natural Resources and Community Development with power to establish rules and regulations to control erosion and sedimentation from land disturbing activities. Mandatory standards established in the act include provision of a buffer between land disturbing activities and natural watercourses or lakes, revegetation of sloped areas, and erosion control on land adjacent to any land disturbing activity undertaken on a tract of an acre or more. Finally, the Dredge and Fill Act, administered by the Division of Marine Fisheries within the Department of Natural Resources and Community Development, requires a permit for dredge and fill activities in estuaries, tidelands, marshlands and state-owned lakes. The required permit may be denied if it is determined that the proposed dredging and filling would have a significant adverse effect on the use of water by the public, the public health, safety and welfare, conservation of public and private water supplies, wildlife or freshwater, estuarine or marine fisheries.

In summary, an array of local and state land use and environmental management measures have been brought to bear on the problems that may accompany recreational land development in the coastal region. In the mountain region, fewer local governments have taken action to plan for and regulate development and fewer state programs designed to mitigate adverse effects have been adopted. A central question is, how effective are the local and state programs in each region? This question is addressed in the following two sections. The first

examines the whole array of state and local programs that are being applied in the coastal and mountain regions. The second focuses on the experience to date with the North Carolina Coastal Area Management program, since this program may be a model for a similar effort in the mountain region.

Local Officials' Evaluations of State and Local Programs

Local public officials in the coastal and mountain regions were asked to assess the effectiveness of existing state and local land use and environmental management programs. Their perceptions are summarized in Table 5-2.

A majority of the officials in both regions--55 percent in the coastal area and 68 percent in the mountains--rated regulation of septic tanks as very effective in preventing septic tank problems. Although severe problems with septic tanks have been reported in some coastal counties, only 11 percent of the coastal officials as a whole rated septic tank regulations as not effective. As shown in Table 5-3, few factors were strongly associated with the local officials' evaluations. Officials who were most likely to give lower ratings to the effectiveness of septic tank regulations tended to perceive a greater number of environmental problems from recreational land development, to have lived a shorter period within the jurisdictions they served, and to have more years of formal education.

In contrast with the relatively high ratings given to the effectiveness of septic tank regulations, a relatively high proportion of officials--29 percent in the coastal region and 41 percent in the mountains--rated the state's sedimentation pollution control regulations as ineffective in preventing erosion from land disturbing activities. When asked to explain the reasons behind their low ratings of this program, the most frequently given answer was that the state had failed to provide adequate manpower in its regional field offices to inspect land disturbing activities and to ensure compliance. However, as

TABLE 5-2

PUBLIC OFFICIALS EVALUATIONS OF AND ATTITUDES TOWARD LAND USE AND ENVIRONMENTAL REGULATIONS

Indicator	Percent of Officials Interviewed	
	Coastal Region	Mountain Region
State Programs		
1. Effectiveness of septic tank regulations in preventing septic tank problems		
Very effective	55	68
Somewhat effective	33	30
Not effective	11	2
2. Effectiveness of state's sedimentation pollution control regulations in preventing erosion from land disturbing activities		
Very effective	30	16
Somewhat effective	41	43
Not effective	29	41
3. Effectiveness of state's dredge and fill regulations in preventing problems from dredging and filling		
Very effective	65	NA
Somewhat effective	29	NA
Not effective	6	NA
4. Effectiveness of Coastal Area Management Act in reducing environmental disruption from second home development		
Significantly reduced disruption	8	NA
Somewhat reduced disruption	37	NA
No influence on environmental disruption or increased	55	NA
5. Effect of Coastal Area Management Act permit system on improving in quality of development		
Significant effect	16	NA
Moderate effect	33	NA
No effect	51	NA

TABLE 5-2 - continued

Indicator	Percent of Officials Interviewed	
	Coastal Region	Mountain Region
Local Programs		
1. Effectiveness of local land use regulations in improving quality of development		
Very effective	24	4
Somewhat effective	49	25
Not effective	27	71
2. Attitude toward county (community) zoning		
Strongly favor	49	36
Somewhat favor	33	33
Neutral or opposed	18	31
3. Attitude toward county (community) subdivision regulations		
Strongly favor	68	63
Somewhat favor	24	28
Neutral or opposed	8	9
4. Attitude toward county (community) sedimentation pollution control ordinance		
Strongly favor	28	57
Somewhat favor	25	25
Neutral or opposed	47	18

shown in Table 5-3, in larger counties and in counties where more recreational land development was taking place (and where sedimentation problems would probably be most severe), the sedimentation pollution control program tended to receive higher ratings. Public officials who were most likely to rate program effectiveness poorly included full-time employees more often than elected officials, and, among elected officials, those whose occupations were not related to the real estate industry. Officials who felt that sedimentation pollution control regulations were not working well also tended to believe that recreational

TABLE 5-3

FACTORS ASSOCIATED WITH OFFICIALS' EVALUATIONS OF STATE ENVIRONMENTAL REGULATIONS

Factor	Zero-Order Correlation Coefficients With Evaluations:[a] Septic Tank Regulations	Sedimentation Regulations	Dredge & Fill Regulations	Coastal Area Management Act Environmental Problems	Coastal Area Management Act Development Quality
Personal Characteristics					
Governmental position[b]	.07	.13	.02	-.00	.04
Occupation[c]					
Public	.05	.21	.14	-.08	.10
Business	-.03	-.09	.02	.03	-.07
Real estate[d]	-.10	-.09	-.09	-.06	-.00
Farm	-.06	-.02	.03	.06	-.00
Education	.10	.09	.11	.06	-.10
Length of residence	-.22	-.06	.26	-.01	.02
Length of government service	.03	-.00	-.07	-.01	-.01
Evaluation of Recreational Land Development					
Number of environmental problems perceived	.24	.10	.02	-.24	.07
Increase in services demanded	.03	-.01	-.18	-.00	-.06
Negative fiscal impact	.04	.02	-.06	-.05	.01
Negative effect on farming	.04	.12	-.03	.11	.08
Number of social problems perceived	.02	.07	.07	-.05	.02
Second home jobs not important	.04	.09	.28	.15	.07
Negative overall evaluation of recreational land development	.08	.20	.30	.09	.10

TABLE 5-3 - continued

Factor	Zero-order Correlation Coefficients With Evaluations:[a] Septic Tank Regulations	Sedimentation Regulations	Dredge & Fill Regulations	Coastal Area Management Act Environmental Problems	Coastal Area Management Act Development Quality
Economic and Social Factors					
Number of recreational properties, 1976	-.03	-.22	-.16	-.21	-.02
Population, 1975	.03	-.22	-.04	-.20	-.05
Population change, 1970-1975	.01	-.07	-.13	-.14	-.05
Per capita income, 1974	-.02	-.12	.09	.00	.01
Region (coastal mountain)	.15	-.19	NA	NA	NA

[a] Sign of coefficients: "+," negative evaluation; "-," positive evaluation.

[b] Coded "1," county commissioner/mayor; "2," county/town manager; "3," planner, sanitarian, soil conservationist, building inspector, planning board chairman.

[c] Coded "1," holds specified occupation; "0," other occupation.

[d] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

land development was not beneficial for their jurisdictions. In addition to the officials interviewed for this study, concern over the effectiveness of the state's sedimentation pollution control program has surfaced elsewhere. For example, over half of the persons polled about the program for the state '208' water quality plan felt that the program was less than 50 percent effective. (Division of Environmental Management, 1979, p. 39)

About two-thirds of the local officials in the coastal region rated the state's dredge and fill regulations as very effective. Only 6 percent thought the regulations were ineffective. As with sedimentation pollution control, dredge and fill regulations were more likely to be rated as effective in counties where more recreational land development was occurring and where population growth was more rapid. Full-time public officials and those who had lived in a county a longer period of time were more likely than others to rate dredge and fill regulations as ineffective. Officials who rated the regulations as ineffective, as with those who were dissatisfied with sedimentation pollution control regulations, were more likely than others to feel that recreational land development was not beneficial for their county.

In addition to evaluating dredge and fill regulations, coastal officials were asked to evaluate the Coastal Area Management Act (CAMA) in terms of (1) reducing environmental disruption from second home development and (2) improving the quality of development. In each case, about half of the officials felt that CAMA had yet to have a discernible effect. However, it must be remembered that these interviews were conducted just as the permitting system mandated by CAMA was going into effect, so the period during which notable effects could accumulate was rather short. In this light, it is significant that 37 percent thought that the Coastal Area Management Act had reduced environmental disruption somewhat (8 percent thought environmental disruption had been reduced

significantly), and almost half thought that the CAMA permitting system was having a moderate (33 percent) or significant (16 percent) impact on the quality of development. As with the other state environmental programs, officials in counties with more second home development and more rapid population growth were more likely than others to rate CAMA as effective. Officials' personal characteristics were not particularly associated with their evaluations, but officials who were aware of a greater number of environmental problems due to recreational land development tended to give CAMA higher ratings than those who perceived fewer problems.

Reflecting the widespread criticism of local land use regulation in the mountain region, 71 percent of the officials interviewed in mountain counties rated local land use regulations as ineffective in improving the quality of development. A quarter of the mountain officials rated local land use regulations as somewhat effective, and only 4 percent said they were very effective. In contrast, a quarter of the coastal officials rated local regulations as very effective in improving the quality of development, with 49 percent rating local regulations as moderately effective. Although the caveat regarding the relatively short period of time the CAMA permit system had been in effect may have led to lower effectiveness ratings than it would receive currently, it is noteworthy that local officials were more likely to rate their own local regulations as effective in improving the quality of development than the CAMA permitting system. Only 27 percent rated their own programs as not effective, while 51 percent perceived no effect from the CAMA permits.

In the introduction to this chapter, it was noted that two aspects of recreational land development--location and site development standards--were of critical importance in terms of the subsequent impacts of development. Local governments can regulate the location of development through zoning, while

subdivision regulations and sedimentation pollution control regulations can be applied to insure that high site development and construction standards are pursued. Because of their importance in local governments' arsenal of potential weapons for maintaining environmental quality, local officials in the coastal and mountain regions were asked whether they favored or opposed each type of regulation. As shown in Table 5-2, less than a majority in either region were strongly in favor of zoning, although coastal officials were less likely than those in the mountains to oppose zoning. On the other hand, about two-thirds in each region favored subdivision regulations and a majority in the mountains--57 percent--favored sedimentation pollution control regulations. In the coastal area, where sedimentation pollution is not as critical, local officials tended to be neutral or opposed to local sedimentation pollution regulations.

Table 5-4 summarizes statistical measures of association between officials' personal characteristics, evaluations of second home development, and characteristics of their jurisdictions and their attitudes toward local land use regulations of various types.

Zoning regulations tended to be favored by officials whose primary occupations were in real estate and by officials whose jurisdictions had more recreational and second home development and faster population growth. Officials whose primary occupations were related to agriculture and who had lived for a longer period of time in their jurisdictions were more likely than others to oppose zoning. Officials' attitudes toward zoning had little association with their perceptions and evaluations of recreational land development.

Unlike zoning, subdivision regulations tended to be opposed by officials whose primary occupations were related to real estate (possibly because subdivision regulations impose higher costs on developers). Officials whose occupations were related to agriculture opposed all forms of local land use

TABLE 5-4

FACTORS ASSOCIATED WITH OFFICIALS' EVALUATIONS OF AND ATTITUDES TOWARD LOCAL LAND USE REGULATIONS

Factor	Zero-Order Correlation Coefficients: Overall Evaluation[a]	Attitude: Zoning[b]	Attitude: Subdivision Regulations[b]	Attitude: Sedimentation Pollution Regulations[b]
Personal Characteristics				
Governmental position[c]	.14	-.07	-.15	-.15
Occupation[d]				
Public	.22	.04	-.05	-.08
Business	-.09	.03	-.04	-.04
Real estate[e]	-.06	-.10	.16	-.03
Farm	-.11	.17	.10	.23
Education	.02	-.01	-.16	-.15
Length of residence	-.01	.17	.12	.03
Length of governmental service	-.05	-.11	-.07	-.08
Evaluation of Second Home Development				
Number of environmental problems perceived	-.10	-.09	-.13	.00
Land price escalation not a problem	.09	.06	-.05	-.18
Negative fiscal impact	.02	.09	.08	-.03
Negative effect on farming	.09	-.01	-.04	-.09
Number of social problems perceived	.08	-.01	-.09	-.02
Negative overall evaluation of recreational land development	.14	.04	.05	-.07

TABLE 5-4 - continued

Factor	Zero-Order Correlation Coefficients:[a] Overall Evaluation	Attitude: Zoning[b]	Attitude: Subdivision Regulations[b]	Attitude: Sedimentation Pollution Regulations
Economic and Social Factors				
Number of recreational property, 1976	-.12	-.16	-.03	-.03
Population, 1975	-.09	-.08	-.13	-.12
Population change, 1970-1975	-.23	-.26	-.05	.00
Per capita income, 1974	-.06	.00	-.07	.04
Region (coast or mountain)	-.41	.16	.04	-.31

[a] Sign of coefficients: "+," not effective; "-," very effective.

[b] Sign of coefficients: "+," oppose regulation; "-," favor regulation.

[c] Coded "1," county commissioner/mayor; "2," county/town manager; "3," planner, sanitarian, soil conservationist, building inspector, planning board chairman.

[d] Coded "1," holds specified occupation; "0," other occupation.

[e] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

regulation, including subdivision regulations. Subdivision regulations were most likely to be favored by officials in planning and environmental positions and by those with more years of formal education and who had lived in their jurisdictions for a shorter period of time. Attitudes toward subdivision regulations were not strongly related to characteristics of an officials' jurisdiction or to the officials' perceptions and evaluations of second home development. As noted above, attitudes toward sedimentation pollution control regulations were strongly related to region--mountain area officials were much more likely to favor this form of regulation than officials in the coastal region. Sedimentation pollution control regulations were also more likely to be favored by officials with more formal education and by officials in planning and environmental positions. They were most likely to be opposed by officials in occupations related to agriculture.

In summary, it has been shown in this section that with the exception of the state's sedimentation pollution control regulations, local officials tend to feel that existing state programs are at least somewhat effective in mitigating various environmental problems that may result from recreational land development. Although many officials--particularly in the mountain region--felt that the state's sedimentation pollution control program was ineffective, mountain officials' receptivity to local sedimentation pollution control programs suggests that a stronger effort could be mounted in that region. On the other hand, the low rating given to the effectiveness of local land use regulation in the mountain region raises questions about any program that is based on local oversight of the land development process.

A number of previous studies of environmental problems in the mountain region have called for greater state intervention to preserve the quality of the environment. According to the North Carolina Public Interest Research Group (Cary, et al., 1975, p. ii), "In light of this evidence of inaction by county

governments while confronted with the fundamental changes occurring in ownership and recreational development, the study urges that a strong role be given to state government in new legislation to insure adequate, comprehensive land use planning for the mountain region." Similarly, the Tri-State Council for the Southern Highlands (formed in 1972 for joint multistate regional planning in that region) recommended in its final report, "The States recognize that strong and workable legal measures are needed to afford effective protection of certain vital resources in the Southern Highlands and will seek to designate a coordinated system of Natural Protective Areas within which appropriate conservation measures may be implemented by law." (Georgia Department of Natural Resources, et al., 1974, p. 40) Although efforts to adopt a more aggressive state program of land use and environmental management for the mountain region through passage of the Mountain Area Management Act failed in the North Carolina General Assembly, interest in an expanded state role remains strong among those concerned about the quality of the mountain environment. In order to provide information that might be useful in the future design of such a program, as well as to provide baseline data with which to gauge future progress on the coast, coastal officials were asked a number of questions about the early functioning of the Coastal Area Management program.

A Closer Look at the Coastal Area Management Program

Four aspects of the Coastal Area Management program were explored in some depth with coastal public officials: (1) citizen participation; (2) intergovernmental relations; (3) designation of areas of environmental concern; and (4) the overall impacts of the program. Results of these lines of questioning, tabulated by type of jurisdiction (town or county) and amount of recreational land development, are summarized in Table 5-5.

TABLE 5-5

PUBLIC OFFICIALS' EVALUATIONS OF THE
COASTAL AREA MANAGEMENT PROGRAM

Evaluation	Percent of Officials Interviewed				
			Amount of Recreational Land Development[a]		
	Total	Resort Towns	High	Medium	Low
Citizen Participation					
1. Performance of Coastal Resources Commission in balancing coastal interests					
Excellent	12	20	6	9	10
Good	42	27	44	50	49
Fair or poor	46	53	50	41	41
2. Coastal Resources Commission's provision of opportunitites for public participation					
Excellent	35	33	25	31	45
Good	40	36	50	51	29
Fair or poor	25	31	25	18	26
3. Actual public participation in implementation decisions					
Excellent	5	5	9	6	3
Good	18	23	24	12	13
Fair or poor	77	72	67	82	84
4. Coastal Resources Commission's receptivity to public input					
Very receptive	41	40	45	41	39
Somewhat receptive	47	43	30	59	51
Not at all receptive	12	17	25	0	10
Intergovernmental Relations					
1. County (community) government given enough freedom to prepare land use plans in its best interests					
Yes	80	78	70	82	85
No	20	22	30	18	15

TABLE 5-5 - continued

Evaluation	Percent of Officials Interviewed				
			Amount of Recreational Land Development[a]		
	Total	Resort Towns	High	Medium	Low
2. Coastal Resources Commission enforcement procedures give adequate weight to county (community) government					
Yes	77	69	79	89	75
No	23	31	21	11	25
3. Criteria for defining "major" and "minor" developments best way of deciding who should grant development permits					
Yes	70	67	50	67	85
No	30	33	50	33	15
Equity					
1. Practice of designating areas of environmental concern fair to landowners					
Yes	62	59	45	70	68
No	38	41	55	30	32
Environmental Coverage					
1. Adequacy of "areas of environmental concern" coverage					
All natural areas needing protection designated	64	74	58	58	61
Most, but not all, areas designated	31	23	37	35	33
Only a few of areas needing protection designated	5	3	5	7	5
Overall Impacts					
1. Policies developed as part of local plans will affect future local government decisions					
Significant effect	33	49	38	21	23
Moderate effect	54	46	57	55	61
No effect	13	5	5	24	15

TABLE 5-5 - continued

Evaluation	Percent of Officials Interviewed				
	Total	Resort Towns	Amount of Recreational Land Development[a]		
			High	Medium	Low
2. Plans used by official in making decision as a (type of official)					
Yes	53	65	29	51	55
No	47	35	71	49	45
3. Coastal Area Management Act has reduced environmental disruption					
Significantly	8	11	6	9	5
Somewhat	37	37	53	37	31
None or increased environmental problems	55	52	41	54	64
4. Overall, effect of Coastal Area Management Act has been					
Very beneficial	12	9	19	17	5
Somewhat beneficial	54	62	43	51	55
Of no benefit or harmful	34	29	38	32	40

[a] For a definition of development categories and number of officials in each, see Tables 3-9 and 3-10.

Citizen Participation

According to the Office of Coastal Zone Management and national Coastal Zone Management Advisory Committee, citizen participation and support has been a major stumbling block for a number of states' coastal zone management programs. (Office of Coastal Zone Management, 1979, p. 59) In North Carolina, public participation was to be "the very foundation" of the state's coastal zone planning process. (Office of Coastal Zone Management, 1978, p. 41) Accordingly, a strong effort was made to have local governments generate grass roots participation in the process of preparing the mandatory county and town land use plans, and a major program was undertaken to inform the public of the CAMA program. In addition, the Coastal Resources Commission has held public

hearings in relation to a number of aspects of the coastal area program. These have included: hearings in each county in connection with the designation of areas of environmental concern; hearings in connection with the adoption of local land use plans and later in connection with the adoption of local implementation and enforcement programs; and hearings, conducted in accordance with requirements of the North Carolina Administrative Procedures Act, prior to the adoption of specific rules, procedures and guidelines by the Coastal Resources Commission. To further participation at hearings and through less formal means the Coastal Area Management program staff has included information and communication specialists.

As shown in Table 5-5, the Coastal Area Management program's citizen participation effort received mixed grades from local officials. A majority of the officials felt that the Coastal Resources Commission had done an excellent or good job of balancing coastal interests (as required by the federal Coastal Zone Management Act) and providing opportunities for citizen participation. Most thought that the Commission was receptive to input from the public. However, when asked about actual citizen participation in implementation decisions, over three-fourths of the local officials rated participation as only fair or poor. These perceptions were generally constant among towns and counties with varying amounts of recreational land development. In the case of actual participation in implementation decisions, officials in the coastal resort towns and counties with a high amount of development activity gave the Coastal Resources Commission higher marks than officials from counties with less development. In all likelihood these officials were more likely to be involved in more controversial decisions that would tend to generate more public participation. Nevertheless, even in the towns and high development counties, two-thirds or more of the local officials rated actual public participation as only fair or poor.

Intergovernmental Relations

The Coastal Area Management program has been structured to provide local governments with a number of means of participation. The fifteen-member coastal Resources Commission consists mostly of persons nominated by local governments, and the forty-seven-member Coastal Resources Advisory Council includes a number of representatives of county and municipal governments. Although local land use plans mandated by the Coastal Area Management Act had to meet state guidelines, promulgation of the guidelines was based on the premise, ". . . that effective implementation of the act depends on providing local government with incentives to participate in the program to the maximum extent possible." (North Carolina Coastal Resources Commission, 1975) In all, plans were prepared and approved by fifty of fifty-two participating counties and municipalities. All of the plans were approved by the Coastal Resources Commission, with only a few returned to the originating local governments. Through their own planning process and through consultations with the staff of the Coastal Resources Commission, local governments participated in the designation of areas of environmental concern. Finally, in implementing the plans and in regulating development within areas of environmental concern, the Coastal Resources Commission relies heavily on local initiatives. In previous comments on local government participation in the Coastal Area Management program, environmental groups have suggested that local governments have been given too much power and have questioned local governments' willingeness to implement the locally adopted land use plans. On the other hand, agricultural and development interests have expressed concern about the erosion of local autonomy (see Office of Coastal Zone Management, 1978b).

Local officials interviewed for this study gave the Coastal Area Management program high marks for intergovernmental relations. See Table 5-5. Four of every five officials felt that their county or town government had been

given enough freedom to prepare land use plans in their jurisdiction's best interests. Thus, the state guidelines under which the plans were prepared were not viewed as oppressive, as some critics of the program have suggested. Almost as many officials--77 percent--felt that enforcement procedures promulgated by the Coastal Resources Commission gave enough weight to their county or town. Finally, seven of every ten officials were satisfied that the definition of major and minor development projects (see above) was the "best way" of deciding whether local governments or the Coastal Resources Commission should have responsibility for development permits within areas of environmental concern. In general, coastal counties with a high amount of recreational land development and incorporated resort towns were least satisfied with intergovernmental aspects of the Coastal Area Management program, while counties with less development activity underway had fewer complaints.

Designation of Areas of Environmental Concern

Two aspects of the designation of areas of environmental concern were explored with local officials--equity (fairness to landowners) and adequacy of coverage. Even though designation of land as an area of environmental concern (AEC) restricts the manner in which affected owners can use their property, a majority of the local officials interviewed--62 percent overall--felt that the AEC process was fair to landowners. Again, those most concerned with the fairness of the regulatory process were officials from the high development counties where more development activity was taking place. Even in those counties, however, 50 percent of the officials rated the practice of designating and regulating AECs as fair to landowners. Apparently local officials agree with the rationale for the regulation of areas of environmental concern: ". . . that in certain areas of the coastal zone private ownership rights are intimately bound up with public goods, such as waters, wetlands, wildlife and . . . parklands

. . . (so that) . . . a system of administrative allocation must supplement the market function in such areas." (Schoenbaum and Silliman, 1976, p. 2)

Overall, public officials tended to be satisfied that land and water needing protection as an area of environmental concern was so designated. Ninety-two percent of those interviewed indicated that most (31 percent) or all (61 percent) such areas had been included. Officials from the incorporated resort towns were most satisfied with the coverage of areas of environmental concern within their jurisdictions, while there was little difference among the counties with varying levels of recreational land development. Types of environmental areas that officials were most likely to point to as not being adequately covered in the AEC designation process included freshwater wetlands, barrier islands, and maritime forests.

Overall Impacts of the Coastal Area Management Program

Four aspects of the overall impacts of the Coastal Area Management program were discussed with local public officials: (1) the effects on future local governmental decisions of policies developed as part of the local plan developed for CAMA; (2) actual use of the plans in making governmental decisions; (3) as discussed earlier, the effect of CAMA in reducing environmental disruption from development; and (4) overall evaluations of the Coastal Area Management program as beneficial or harmful for local jurisdictions. Responses are summarized in Table 5-5.

In the first case, most local governmental officials--over eight of every ten--felt that the policies adopted with their local land use plans would have either a moderate (54 percent) or significant (33 percent) effect on future local government decisions. Thus, from the local perspective, the plan-making process and resulting plans and policies appear to be serving a useful purpose. In fact, a majority of the officials--53 percent--reported that they had already

used the plans in making decisions in their jobs as a county commissioner, sanitarian, or other official capacity in local government.

As reported earlier, a majority of the local officials had yet to observe a reduction in environmental disruption from development as a result of the Coastal Area Management program. However, since regulation of development in areas of environmental concern was just going into effect when these interviews were conducted (spring of 1978), this result should not be surprising. Not enough time had elapsed for major effects to have accumulated. In this regard, it is encouraging that in those counties with the highest amount of land development activity, and where environmental protection is most needed, a majority of the officials interviewed felt that CAMA was reducing environmental disruption somewhat (53 percent) or significantly (6 percent). The counties where local officials were least likely to observe some effect on the environment from CAMA were those where the least amount of recreational land development had occurred.

Overall, local public officials tended to feel that the Coastal Area Management program had been beneficial for their jurisdictions. Twelve percent rated the program as highly beneficial and 54 percent as somewhat beneficial. Given the controversy and local opposition that accompanied passage of the Coastal Area Management Act in 1974, it is highly significant that only four years later only a third of the local public officials contacted for this study felt that the program was of no benefit to their jurisdictions. Table 5-6 summarizes the associations of selected factors with public officials' overall evaluation of the benefits of the Coastal Area Management program. In general, whether an official was elected or a public employee had little systematic effect on his or her evaluation. On the other hand, among elected officials those whose primary occupations were related to the real estate industry were significantly more likely than others to rate CAMA's effect on

TABLE 5-6

FACTORS ASSOCIATED WITH OFFICIALS' OVERALL EVALUATION OF COASTAL AREA MANAGEMENT ACT

Factor	Zero-Order Correlation Coefficients with Overall Evaluation[a]
Personal Characteristics[b]	
Governmental position	.06
Occupation[c]	
Public	.03
Business	-.01
Real estate[d]	.16
Farm	.03
Education	-.08
Length of residence	.14
Length of governmental service	.07
Evaluation of Recreational Land Development	
Number of environmental problems perceived	-.15
Negative fiscal impact	-.00
Second home jobs not important	.08
Negative effect on farming	.06
Negative effect on fishing	-.17
Number of social problems perceived	-.04
Negative overall evaluation of recreational land development	.01
Economic and Social Factors	
Number of recreational properties, 1976	-.10
Population, 1975	-.14
Population change, 1970-1975	-.13
Per capita income, 1974	-.03

[a] Sign of coefficients: "+," impact of Coastal Area Management Act not beneficial; "-," impact of Coastal Area Management Act beneficial to county or community.

[b] Coded "1," county commissioner/mayor; "2," county/town manager, "3," planner, sanitarian, soil conservationist, building inspector, planning board chairman.

[c] Coded "1," holds specified occupation; "0," other occupation.

[d] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

their jurisdiction as not beneficial. Other elected officials' occupations examined--public, business, farming--were not strongly associated with either positive or negative attitudes toward the program. Among the other personal characteristics of officials that were analyzed in relation to their assessments of CAMA, it was found that officials with more years of formal education tended to feel the program was beneficial, while those who had lived for a longer period of time in the jurisdiction they served were less likely to perceive the program's benefits.

Public officials who were aware of a larger number of environmental problems stemming from recreational land development and those who perceived negative impacts on the fishing industry from development, in particular, tended to view the Coastal Area Management program as beneficial for their jurisdictions. The officials' perceptions of other impacts--fiscal, social, economic--were not strongly related to their overall evaluations of CAMA, nor was the officials' overall evaluation of the net benefits and costs of recreational land development. On the other hand, officials who served jurisdictions that were experiencing more recreational land development and where population growth between 1970 and 1975 had been greatest tended to give the program higher marks than other local officials.

In summary, this evaluation of the Coastal Area Management program, which came after the initial period of program development and plan making, suggests that the experience of the coast with the innovative state-local management process initiated by the Coastal Area Management Act has been positive. Local public officials, who were among the Act's most vociferous critics when it was first passed by the General Assembly, are for the most part satisfied with their role in the coastal area management process and see a number of positive results of the program. In addition, as shown earlier in this chapter, the Coastal Area Management program appears to be promoting more widely accepted

and more effective local land use management programs than have evolved in the North Carolina mountain region, where a companion regional environmental management program was defeated in the state General Assembly. Based on these findings, the adoption of a similar land use and environmental management program for the mountain region should be reconsidered. This possibility is discussed further later in the following section.

Future Policies and Programs for Recreational Land Development

Although current efforts to mitigate environmental and other adverse impacts from recreational land development are, with some exceptions, regarded highly by local officials, the fact that many officials see problems persisting into the future suggests that more can be done to protect sensitive environments and to improve the quality of development that will take place over the coming years. One approach is to improve the administration of state and local programs that are currently underway. As evidenced by the various plans prepared by the state '208' water quality planning program, public officials are often aware of the deficiencies in existing programs, such as sedimentation pollution control, and are taking steps to improve their application. A second approach is to mount new policies and programs. In the remainder of this report, a number of ideas regardings ways of mitigating adverse consequences from recreational land development are explored. They include expanding the roles of existing institutions in relation to land development, adopting nonregulatory measures for environmental improvement, and expanding of the state government's role in environmental protection. Local officials were asked to appraise the potential effectiveness of many of the proposed approaches, and where the approaches might be controversial to indicate whether they favored or opposed the proposed program.

Expanded Roles for Existing Institutions

As noted earlier in this chapter, one means of minimizing environmental problems (and subsequent adverse fiscal impacts from recreational land development) is to improve the quality of site planning and construction. Subdivision regulations provide one method of insuring that specified standards are met during the course of development, but often regulations specify minimal standards and are difficult to enforce effectively with the limited manpower available to many rural jurisdictions. As a supplement to county and town subdivision regulations, existing rural institutions (that often have an established network of contacts with landowners) can be called upon to promote higher standards in land development. In many cases, this would require redirection of an organization's program, but in others it could be accomplished with only slight changes. For example, soil and water conservation districts are already promoting good drainage and soil conservation practices in agricultural activities. It would be simple for them to expand their activities in showing farmers and other rural landowners the advantages of and methods for preventing erosion through proper subdivision site design and construction practices. Similarly, the Agricultural Extension Service, which played a major role in explaining the Coastal Area Management program to rural residents in the coastal region, could offer advice and assistance about proper rural land development. Community colleges could offer or expand courses in real estate and land development, stressing the advantages of proper location and site design and development. Other existing institutions could play similar roles in increasing rural landowners' sensitivity to and knowledge of appropriate land development practices. Since many land developers, as shown in Chapter Two, are small-scale firms without access to outside professionals, advice provided through existing rural institutions might be very effective in improving the quality of recreational land development projects. As shown in Table 5-7, a majority of the local

TABLE 5-7

OFFICIALS' ATTITUDES TOWARD EXPANDED ROLES
FOR EXISTING INSTITUTIONS

Organization/Program	Percent of Officials Who Favor Expanded Role in Helping to Promote Good Land Development	
	Coastal Region	Mountain Region
1. Agricultural Extension Service	50	56
2. Soil and Water Conservation Districts	58	72
3. Community Colleges	65	73
4. Economic Development Councils	61	70
5. Community Involvement Councils	63	71
6. County Planning Commissions	64	74
7. Marine Resources Center	61	NA
8. Sea Grant College Programs	65	NA

NA = Not applicable.

officials interviewed for this study concurred. They tended to favor an expanded role in helping to improve recreational land development by eight organizations/programs, including: (1) Agricultural Extension Service; (2) soil and water conservation districts; (3) community colleges; (4) economic development councils; (5) community involvement councils; (6) county planning commissions; (7) marine resource centers; and (8) the North Carolina Sea Grant College Program.

Nonregulatory Measures for Environmental Improvement

These existing institutions could serve as vehicles for the delivery of various "nonregulatory" measures for mitigating adverse impacts attributable to recreational land development. Potential nonregulatory measures include: (1) environmental awareness programs designed to acquaint land developers and other local residents with the environmental and other types of problems that can result from land development in environmentally sensitive areas; (2) free technical assistance to land developers, so that once they are aware of the benefits of environmentally sound land development practices, they will have help in applying them; and (3) increased citizen oversight of local government decision making, so that citizens can ensure that their local officials are fully aware of the consequences of approving and providing services to recreational land development projects.

Local officials in the North Carolina coastal and mountain regions were asked to assess the potential effectiveness of each of the three possible nonregulatory approaches. In most cases, officials thought that the measures would have a "moderate" effect on the quality of recreational land development in their jurisdictions. See Table 5-8. In the coastal region, officials rated the potential effectiveness of free technical assistance for developers highest (27 percent thought such a program would have a significant effect on the quality of development; 52 percent thought the effect would be moderate). Coastal officials were least enthusiastic about environmental awareness programs, with 31 percent feeling they would have no significant effect. In the mountains, on the other hand, officials felt that increased citizen oversight of local governmental decision making would be most likely to result in improved quality of development.

TABLE 5-8

PUBLIC OFFICIALS' ATTITUDES TOWARD NEW APPROACHES TO IMPROVING THE QUALITY OF DEVELOPMENT

	Percent of Officials Who Rate Effect of Approach on Improving Quality of Development as Potentially:		
	Significant	Moderate	No Effect
1. Environmental awareness activities in high schools, community colleges, and community centers			
Coastal officials	16	53	31
Mountain officials	24	62	14
2. Free technical assistance to land developers			
Coastal officials	27	52	21
Mountain officials	32	46	22
3. Increased citizen oversight of local government			
Coastal officials	23	49	29
Mountain officials	32	57	12

Expanded Roles for State Government

Since the state's Coastal Area Management program appears to be working well, attention to additional roles for state government in land use and environmental planning and management was focused on the mountain region. Local jurisdictions' reluctance to enact land use regulations and the apparent ineffectiveness of measures that have been adopted have led a number of observers to call for an expansion in state activity to protect the mountain environment. However, although the idea of greater state involvement in land use planning and management has drawn modest citizen support (see Christenson, 1977), efforts to enact specific legislation have failed. On two occasions a Mountain Area Management Act, similar to the coastal act analyzed above, has been introduced into the General Assembly. The proposed act called for a fifteen-member

Mountain Commission to oversee a comprehensive state-local planning process, designation of specific areas of environmental concern in the mountain region, and the enforcement of environmental protection through a system of development permits for projects to be built in the identified environmentally sensitive areas. On both occasions the proposed act was defeated after it drew heated opposition from local governments and state legislators from the mountain region (see Hill, 1977).

In recent years, attention has shifted from state regulation, as exemplified by the coastal and mountain area management acts, to the concept of statewide mandatory county and town planning. In 1974, the General Assembly established the North Carolina Land Policy Council and charged the Council with responsibility for preparing a state land policy, developing a land classification system, and making other recommendations to encourage "the wise and balanced use of the state's resources." In its report to the General Assembly, issued in 1976, the Council proposed that state policy encourage the protection of land with various environmental constraints and encourage development only where public services could be extended most efficiently. Areas that were viewed as unsuitable for development included:

> . . . areas with severe physical limitation for development with public services; land which meets the definition of the conservation class including Areas of Environmental Concern; land of special value such as the following unless no other reasonable alternative exists: productive and unique agricultural lands, productive forest lands, potentially valuable mineral deposits; potential aquifers and key parts of water supply watersheds, scenic tourist resources, habitat for economically valuable wildlife species, flood fringe lands, open coast flood hazard areas and estuarine flood hazard areas. (Office of Coastal Zone Management, 1978, p. 102)

Protection of these areas was to be encouraged through mandatory state and local land classification planning, which was to be conducted in accordance with standards and guidelines established by a new state land resources

commission. Although a bill to establish the proposed land resources commission was introduced in 1977, the proposed state land policy was opposed by agricultural interests, and never received enough support from other quarters to be passed by the state General Assembly.

A number of other approaches to state land use and environmental planning and management have been adopted by other states (see Healy and Rosenberg, 1979 and Pelham, 1979). For example, a few states have adopted "state zoning" in which the state prescribes or prohibits various land uses in areas of particular state concern. In other cases, the states have allowed land use regulations to remain in local hands, but have retained the right to review local decisions and to veto projects which fail to meet state standards. In Maryland, the state has the right to review large projects subject to local land use controls and to participate in local regulatory proceedings, but the state cannot veto local decisions regarding projects. In still other cases, states have required local governments to plan for and to regulate land development activity, with provision for state assumption of these powers if local governments fail to act. Given the strong interest in North Carolina in "local control," this latter approach appears to be particularly relevant to areas of the state, such as the mountain region, where land development activity is producing adverse environmental and other impacts, but more comprehensive state roles in regulating development have met with little enthusiasm.

Local officials in the North Carolina mountain region were asked whether they would favor or oppose each of three major roles for state government in land use and environmental management: (1) mandatory local land classification planning, as proposed by the North Carolina Land Policy Council; (2) mandatory local land use regulation; and (3) state regulation and permitting of projects in areas of environmental concern, as proposed in the Mountain Area Management

Act. Their responses are summarized in Table 5-9. Overall, each state role was favored by a majority of the officials who were interviewed. However, opinions varied dramatically, depending upon the official's position in local government and other factors (also see Table 5-10).

For example, mandatory local land classification was favored by 57 percent of the officials interviewed, and, if a provisio was added calling for state financing of the required planning, by 78 percent. However, while county planners, sanitarians, and district conservationists were strongly in favor of mandatory land classification planning, as illustrated in Table 5-9, county commissioners and county managers were much less enthusiastic. Similarly, although overall 55 percent of the officials favored mandatory local land use regulation and a surprising 70 percent favored state regulation and permitting of projects in areas of environmental concern, in both cases the proposed state programs were not favored by a majority of the county commissioners who were interviewed. Thus, while local governmental staff professionals, who are close to and aware of the problems caused by development in fragile mountain environments, favor state intervention to protect the environment, a greater state role has yet to garner support from a majority of local political leaders. Nevertheless, the fact that 45 percent of the county commissioners and 70 percent of the county managers favored state control of development in areas of environmental concern may indicate that a state program focused on only those areas subject to environmental damage may be able to win local support, if it were accompanied by adequate inducements for local governmental participation. Given the apparent success of the Coastal Area Management program, a similar effort in the mountains might be more warmly received than in the past.

One inducement for local participation in any state mandated planning and regulatory effort would be state financing of local land use planning. Because of extensive state and federal land holdings in the mountain region and the

TABLE 5-9

PUBLIC OFFICIALS' ATTITUDES TOWARD STATE INTERVENTION IN MOUNTAIN AREA LAND USE MANAGEMENT

	Percent of Officials Who Favor:		
	Mandatory Local Land Classification Planning[a]	Mandatory Local Land Use Regulations[b]	State Regulation and Permitting of Projects in Areas of Environmental Concern[c]
Total	57[d]	55	70
By Extent of Recreational Land Development in County			
High (N = 44)	57	60	66
Medium (N = 12)	64	50	75
Low (N = 20)	53	48	76
By Type of Official			
County commissioner (N = 26)	26	40	45
County manager (N = 10)	30	40	70
Planning board chairman (N = 11)	55	27	73
Staff planning director (N = 6)	100	83	83
County sanitarian (N = 17)	60	65	88
District soil conservationist (N = 17)	94	82	77

[a] QUESTION: First, are you in favor of state regulations which make county land classification planning mandatory?

[b] QUESTION: Some states have passed legislation which makes local land use regulation mandatory. Do you believe that similar legislation should be enacted by the State of North Carolina?

[c] QUESTION: Do you believe that the State of North Carolina should require permits for land development projects over a certain size in areas of environmental concern in the mountain region?

[d] A much higher proportion of officials, 78 percent, would support mandatory local land classification planning if it was financed by the state. This includes 68 percent of the county commissioners, 60 percent of the county managers, 64 percent of the planning commission chairmen, 87 percent of the sanitarians, 94 percent of the district soil conservationists, and all of the county planners interviewed.

TABLE 5-10

FACTORS ASSOCIATED WITH MOUNTAIN OFFICIALS' ATTITUDES TOWARD STATE INTERVENTION IN LAND USE MANAGEMENT

Factor	Zero-Order Correlation Coefficient with Attitudes[a]		
	Mandatory Local Land Classification Planning	State Aid for Local Land Use Planning	State Standards with State Planning Aid
Personal Characteristics			
Governmental position[b]	-.33	-.26	-.35
Occupation[c]			
Public	-.17	-.30	-.26
Business	.13	.08	.03
Real estate[d]	.35	.35	.35
Farm	.02	.03	-.10
Education	-.12	-.28	-.25
Length of residence	.32	.12	.15
Length of government service	.11	.09	.07
Evaluation of Recreational Land Development			
Number of environmental problems perceived	.28	-.06	-.19
Increase in services or demanded	-.09	.03	-.07
Negative fiscal impact	-.01	.01	-.16
Negative effect on farming	-.07	-.13	-.13
Number of social problems perceived	-.04	.03	.05
Negative overall evaluation	-.18	-.10	-.16
Economic and Social Factors			
Number of recreational properties, 1976	.04	.10	.09
Population, 1975	.02	.04	.24
Population change, 1970-1975	-.10	-.00	.05
Per capita income, 1974	-.08	.08	.21

[a] Sign of coefficients: "+," opposed intervention; "-," favor intervention.

[b] Coded "1," county commissioner/mayor; "2," county/town manager; "3," planner, sanitarian, soil conservationist, building inspector, planning board, chairman.

[c] Coded "1," holds specified occupation; "0," other occupation.

[d] Includes realtors, bankers, motel operators, construction company owners/managers, insurance salesmen.

depressed economic state of the area, local governments have been under severe fiscal strains in providing even basic public services. Land use and environmental planning and management are not high priority uses of local fiscal resources (see Great Smokies Regional Planning Team, 1977, p. 6-3). Table 5-11 shows, however, that officials would be receptive to state financial assistance for local land use planning, even when such assistance was accompanied by state standards. Although federal funds are not as readily available as they were for planning in the coastal region, where $1.6 million was made available for local land use planning, the benefits from a major state-financed planning effort may be substantial. As shown in this and the preceding chapters, coastal officials were more likely than their counterparts in the mountains to be aware of environmental problems and to support state and local efforts to maintain environmental quality. In large part this difference may be attributed to the major planning and environmental education program that was undertaken as part of the state's Coastal Area Management program. A similar program in the mountains might go far toward building the base of local support needed for the land use regulations and other measures required to implement plans once they have been prepared.

Summary

Local governments and the State of North Carolina have embarked on a number of programs to mitigate environmental and other adverse effects from recreational land development in the coastal region. In the mountain region, fewer programs have been enacted by local governments and the state, and those that have been tend to be judged by local officials as ineffective.

The Coastal Area Management program, a major innovation in land use and environmental management and protection in North Carolina, appears to be working well from the perspective of local governments in the coastal region. Local

TABLE 5-11

PUBLIC OFFICIALS ATTITUDES TOWARD STATE ASSISTANCE FOR LOCAL LAND USE MANAGEMENT

	Percent of Officials Who Favor:	
	State Financial Assistance for Local Land Use Planning	State Planning Standards with Assistance
Total	81	72
By Extent of Recreational Land Development in County		
High (N = 44)	79	66
Medium (N = 12)	92	92
Low (N = 19)	79	75

officials rated the Coastal Area Management program highly in terms of the provision of opportunities for citizen participation (although actual participation was less highly regarded) and in balancing conflicting coastal interests. Local officials were also satisfied with the roles their governments had played in the coastal area management process and tended to feel that regulation of areas of environmental concern was fair to landowners. The major local land use planning effort fostered by the Coastal Area Management program has begun to have an effect on local governmental decision making. In addition, a significant proportion of local officialsbelieved that the program has reduced environmental disruption from development, even though the regulatory phase of the program had been in effect only a short while when they were asked to provide an assessment. Finally, it is noteworthy that a majority of the local officials interviewed for this study felt that the Coastal Area Management program has been beneficial for their jurisdiction.

The apparent success of the Coastal Area Management program suggests that a similar approach to mitigating the adverse consequences of recreational land

development in the mountain region might be undertaken, even though earlier attempts to pass a Mountain Area Management Act failed in the General Assembly. Although state designation and regulation of areas of environmental concern in the mountains is still opposed by a majority of elected officials, a significant proportion--45 percent of those interviewed--now favor this approach to environmental management. Support among local governmental staff professionals in the mountains--planners, sanitarians, soil conservationists--is overwhelming. In addition, the professionals, but not elected officials, also favor state-mandated local land classification planning and mandatory local land use regulation in the mountain region.

Finally, local officials strongly supported nonregulatory approaches to improving environmental quality. In the mountains, local officials were in favor of state financial assistance for local land use planning, even when such assistance included state-imposed standards. In both the coast and mountains, local officials felt that existing state and local institutions could do more to promote good land development practices. Potential new programs that drew support included the provision of free technical assistance to land development firms, promotion of environmental awareness by high schools and community colleges, and increased citizen oversight of local governmental decision making.

References

American Society of Planning Officials. 1976. Subdividing Rural America: Impacts of Recreational Lot and Second Home Development. Washington: U. S. Government Printing Office.

Cary, William, Molly Johnson, Meridith Golden, and Trip Van Noppen. 1975. The Impact of Recreational Development: A Study of Landownership, Recreational Development and Land Use Planning in the North Carolina Mountain Region. Durham: North Carolina Public Interest Research Group, April.

Christenson, James A. 1977. "Citizens' Views on Land Use Planning and Control," in Land Use Planning in Rural Areas: Issues, Problems, Alternatives, Leon E. Danielson, ed. Raleigh: North Carolina Agricultural Extension Service, June.

Division of Environmental Management, North Carolina Department of Natural Resources and Community Development. 1979. Water Quality Management Plan for Construction. Raleigh: The Division, January 1.

Georgia Department of Natural Resources, North Carolina Department of Administration, and South Carolina Department of Parks, Recreation, and Tourism. 1974. Southern Highlands Mountain Resources Management Plan, Volume 1. Atlanta: Georgia Department of Natural Resources, June.

Great Smokies Regional Planning Team. 1977. Guidelines for Recreation Resource Use in the Great Smokies Region. Norris, Tenn.: Division of Forestry, Fisheries and Wildlife Development, Tennessee Valley Authority, September.

Hahn, Allan J. 1970. "Planning in Rural Areas." Journal of the American Institute of Planners, Vol. 34 (January), pp. 44-49.

Healy, Robert G. and John S. Rosenberg. 1979. Land Use and the States. Second Edition. Baltimore: The Johns Hopkins University Press.

Hill, Cecil. 1977. "Natural Resources Management in Western North Carolina: Legislator's Perspective," in Western North Carolina Research Resource Management Conference. Proceedings. Asheville: Southeastern Forest Experiment Station, pp. 36-40.

North Carolina Land Policy Council. 1976. A Land Resources Program for North Carolina. Raleigh: The Council, December.

Office of Coastal Zone Management, National Oceanic and Atmospheric Administration. 1979. The First Five Years of Coastal Zone Management. Washington: The Author, March.

Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, Department of Commerce and North Carolina Coastal Management Program. 1978a. State of North Carolina Coastal Management Program and Draft Environmental Impact Statement. Washington: U. S. Department of Commerce.

Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, Department of Commerce and North Carolina Coastal Management Program. 1978b. State of North Carolina Coastal Management Program and Draft Environmental Impact Statement. Appendices. Washington: U. S. Department of Commerce.

Pelham, Thomas G. 1979. State Land-Use Planning and Regulation. Lexington, Mass.: D. C. Heath and Company, Lexington Books.

Rice, David A. 1976. "Taking" by Regulation and the North Carolina Coastal Area Management Act. Raleigh: Sea Grant Program, University of North Carolina, July.

Schoenbaum, Thomas J. and Kenneth G. Silliman. 1976. Coastal Planning: The Designation and Management of Areas of Critical Environmental Concern. Raleigh: University of North Carolina Sea Grant College Program, November.

Southern Appalachian Research-Resource Management Cooperative. 1977. Priorities for Natural Resources Research: A Systems Analysis for Western North Carolina. Raleigh: The Author, May.

Tombaugh, Larry W. 1970. "Vacation Homes, Environmental Preferences, and Spatial Behavior," Paper presented at the 1969 Meeting of the American Association for the Advancement of Science, December.

APPENDIX A

SURVEY OF RESIDENTIAL DEVELOPERS: SUMMER 1977 - QUESTIONNAIRE

SURVEY OF RESIDENTIAL DEVELOPERS

Summer 1977

Questionnaire

Contents

INSTRUCTIONS

We appreciate your cooperation in helping us carry out this survey of North Carolina's residential developers. It is aimed at providing insights on the practical problems of managing the residential development process.

The information you provide will be treated in strict confidence, and presented in a manner that will not reveal the identity of any developer or project. The questionnaire is designed to draw on your judgments about problems and opportunities for change, and to make use of information that is readily available. Therefore, your "best estimate" will be most helpful in cases where information is difficult to obtain.

Most of the questions ask that you choose among several possible responses. Where these choices do not fit your situation, please feel free to list any that seem more appropriate, and use additional sheets of paper where necessary.

To enable us to prepare a timely report of the survey results for you and other participants, we would appreciate your returning this form at your earliest convenience in the enclosed stamped envelope to:

Dr. Raymond J. Burby, III
Assistant Director for Research
Center for Urban and Regional Studies
The University of North Carolina
Hickerson House 067 A
Chapel Hill, North Carolina 27514
Phone: 919-933-3074

I. BACKGROUND AND STRATEGY

1. **Name of residential development firm:** _____

2. **When was the firm established?** _____

3. **In which of the following areas does the firm operate?** (check all that apply)

   ☐ a. Land development

   ☐ b. Building

   ☐ c. Real estate brokerage

   ☐ d. Appraising

   ☐ e. Property management

   ☐ f. Other (please specify: _____)

4. **How is the firm organized?** (check)

   ☐ Publicly owned corporation

      ☐ Corporate subsidiary

      ☐ Corporate division

   ☐ Closely held corporation

   ☐ Joint venture or partnership

   ☐ Single ownership, unincorporated

   ☐ Other (please specify: _____)

5. **How many persons are employed by your firm?** _____

6. **How many persons are allocated to each of the following functions?**

   _____ a. Planning

   _____ b. Finance

   _____ c. Land development

   _____ d. Building/construction

   _____ e. Marketing

   _____ f. Other functions

7. **How did you build staff competence in residential development?** (check where applicable)

☐ a. Used existing staff talent

☐ b. Acquisition of outside firm

☐ c. Retention of consultants

☐ d. Other (please specify: _____)

8. **How important were each of the following factors in your firm's decision to enter into residential land development?** (check)

	Very Important	Somewhat Important	Not Important
a. Gain tax-sheltered cash flow	☐	☐	☐
b. Use excess cash flow	☐	☐	☐
c. Gain reportable current earnings	☐	☐	☐
d. Build long-term earnings/ asset base	☐	☐	☐
e. Provide adequate rate of return	☐	☐	☐
f. Provide hedge against inflation	☐	☐	☐
g. Diversify investment base	☐	☐	☐
h. Use excess property	☐	☐	☐
i. Use property under development pressure	☐	☐	☐
j. Other factor (please specify: _____)	☐	☐	☐

9. **What are the most important strengths of your firm?** (Rank 1 through 10: 1 = most important; 2 = next most important, etc.)

_____ a. Sufficient resources for large-scale planning and development

_____ b. Ability to raise new capital

_____ c. Patient capital

_____ d. Capacity to pioneer conceptual, design, or marketing advances

_____ e. Diversity of projects (spread of risk)

_____ f. Application of scientific management methods

_____ g. Knowledge of market

_____ h. Ability to attract superior architects and builders

_____ i. Reputation and track record

_____ j. Small enough scale to maintain close supervision of projects

10. **Please list the residential projects your firm has developed during the past 10 years.**

Name of Project	Location (County and nearest crossroads)	Year Construction Started	Acres	Lots	
				Number	Percent Sold

11. **What was your firm's total finished lot sales volume during the past five years?** (check for each year)

1972	1973	1974	1975	1976	
☐	☐	☐	☐	☐	Less than $100,000
☐	☐	☐	☐	☐	$100,000 - $249,000
☐	☐	☐	☐	☐	$250,000 - $499,999
☐	☐	☐	☐	☐	$500,000 - $999,999
☐	☐	☐	☐	☐	$1,000,000 - $4,999,999
☐	☐	☐	☐	☐	$5,000,000 or more

12. **How close have your residential development projects come to meeting the financial goals originally set for them?** (circle one)

Will Significantly Fall Short		Will Meet Goals		Will Significantly Exceed Goals
1	2	3	4	5

13. **If your projects have fallen short of meeting your financial goals, what are the three most critical reasons?**

(1) _____

(2) _____

(3) _____

II. LOCATION AND LAND ACQUISITION

Please answer the questions in this and the following sections with reference to your firm's most recent residential development project in the North Carolina mountains.

1. **Name of residential development project:** _____

2. **Where is the project located?**

   County: _____

   Nearest road intersection: _____

3. **When did (will) construction of the project begin?** _____

4. **What is your target date for completion?** _____

5. **What stage of development is the project now in?** (check)

   ☐ Initial feasibility evaluation

   ☐ Planning

   ☐ Land development

   ☐ Sales and building construction

   ☐ Substantially completed

6. **If development has begun, please indicate the following:**

   a. Total residential lots (June 1977): _____

      Sold: _____

      Ready to sell: _____

      In preparation: _____

   b. Ultimate number of residential lots in project: _____

   c. Total developed acreage (June 1977): _____

d. Number of acres devoted to:

Residential land uses: _____

Retail land uses: _____

Commercial recreation (open to public) land uses: _____

Community recreation land uses: _____

Unimproved open space: _____

Civic, cultural, church, institutional land uses: _____

Roads: _____

Other land uses: _____

7. **In what year was the initial parcel for this project acquired?** _____

8. **How did the firm learn about the availability of the parcel?** (check)

☐ Landowner

☐ Realtor

☐ Newspaper advertisement

☐ Other (please specify: _____)

9. **Which of the following statements best describes how the firm acquired the parcel?** (check)

☐ Searched actively for this land to meet a market demand for lots/homes in a specific price range.

☐ Came across this parcel of land and, on assessing it for its highest use, decided a market existed at a particular price range.

10. **How was the land financed?**

_____% Cash

_____% Purchase note

_____% Other (please specify: _____)

_____

100%

11. **What was the approximate cost of the parcel per acre?** (check)

☐ Less than $100

☐ $100 - $249

☐ $250 - $499

☐ $500 - $749

☐ $750 - $999

☐ $1,000 - $1,499

☐ $1,500 - $1,999

☐ $2,000 or more

12. **Did you take an option on or seriously consider any other parcels for this project?** (check)

☐ No

☐ Yes

13. **If yes, why did you reject it (them)?**

_____

_____

_____

14. **Please indicate whether each of the following factors was very important, somewhat important, or not important in your firm's decision to develop this project at this location.** (check)

	Very Important	Somewhat Important	Not Important
a. Size of the parcel	☐	☐	☐
b. Percent of parcel not developable into lots because of steep slopes, impermeable soil, etc.	☐	☐	☐
c. Percent of parcel with tree cover	☐	☐	☐
d. Topography of parcel (views, vistas, etc.)	☐	☐	☐
e. Distance to nearest U.S. or Interstate highway	☐	☐	☐
f. Distance to nearest established resort area	☐	☐	☐
g. Availability of ground water on site	☐	☐	☐
h. Availability of surface water on site (streams)	☐	☐	☐
i. Potential lake site(s)	☐	☐	☐
j. Potential golf course site	☐	☐	☐
k. Potential ski slope	☐	☐	☐
l. Lack of zoning or subdivision restrictions	☐	☐	☐

		Very Important	Somewhat Important	Not Important
m.	Paved road access	☐	☐	☐
n.	Scenic quality of approach and parcel	☐	☐	☐
o.	Other important factors:			

_____

_____

_____

15. **How near completion must this subdivision be before you decide on the location of another subdivision in the same price range?**

_____% Completed (number of lots)

16. **How near completion must this subdivision be before you begin development of another subdivision in the same price range?**

_____% Completed (number of lots)

17. **Have there been any changes in public policies in the North Carolina mountain region in recent years that have affected your firm's land development location decisions?** (Check)

☐ Yes

☐ No

18. **If yes, please describe these changes and how they have affected you/your firm's location decisions.**

_____

_____

_____

III. PLANNING AND DESIGN

1. **Who is (was) responsible for subdivision planning and site design?**

   ☐ In-house (Name of manager: _____)

   ☐ Consultant (Name and location of firm: _____)

2. **Which of the following statements best describe the principal working assumptions underlying the plan for this project?** (check all that apply)

   ☐ a. People will pay a premium for a project in which a full range of community facilities and services (water, sewer, etc.) are provided.

   ☐ b. People are attracted by a rustic setting which provides few "urban" facilities and services.

   ☐ c. The provision of on-site recreational facilities is more important than other types of community facilities.

   ☐ d. People will pay a premium for a project which maintains ecological standards and capitalizes on natural features.

   ☐ e. Recreational property for persons with moderate, middle, and high incomes can be provided in the same project.

   ☐ f. On-site amenities are not important if they are available in the surrounding area.

   ☐ g. People need to identify with individual neighborhoods or sections of a project.

   ☐ h. People will settle for small lots if a variety of community facilities and amenities are available.

   ☐ i. Other (please specify: _____)

3. **Please describe the five natural physical characteristics and environmental features or resources which most strongly influenced the planning for this project.**

   (1) _____

   (2) _____

   (3) _____

   (4) _____

   (5) _____

4. **What are the five most unique or innovative man-made features, attractions, and amenities provided for in the plan for this project which set it apart from the competition.**

(1) _____

(2) _____

(3) _____

(4) _____

(5) _____

5. **To what extent and for how long were/are the operating costs of these amenities subsidized in order to stimulate sales and development?**

_____

_____

_____

6. **Please indicate which of the following features and amenities are included in this project and, for those that are included, who is responsible for operation and maintenance.**

Available				Operation and Maintenance Responsibility				
Yes	No		Feature	Developer	Property Association	Commercial Lessee	Individual Owners	Other
☐	☐	a.	Private streets	☐	☐	☐	☐	☐
☐	☐	b.	Paved streets	☐	☐	☐	☐	☐
☐	☐	c.	Landscaped entrance	☐	☐	☐	☐	☐
☐	☐	d.	Underground telephone and electricity	☐	☐	☐	☐	☐
☐	☐	e.	Community club house	☐	☐	☐	☐	☐
☐	☐	f.	Undeveloped open space	☐	☐	☐	☐	☐
☐	☐	g.	Community lake(s)	☐	☐	☐	☐	☐
☐	☐	h.	Golf course	☐	☐	☐	☐	☐
☐	☐	i.	Central water system	☐	☐	☐	☐	☐
☐	☐	j.	Central sewer system	☐	☐	☐	☐	☐
☐	☐	k.	Curb and gutter	☐	☐	☐	☐	☐
☐	☐	l.	Street lights	☐	☐	☐	☐	☐
☐	☐	m.	Piped storm drainage	☐	☐	☐	☐	☐

Available Yes	Available No		Feature	Operation and Maintenance Responsibility: Developer	Property Association	Commercial Lessee	Individual Owners	Other
☐	☐	n.	Community swimming pool	☐	☐	☐	☐	☐
☐	☐	o.	Tennis courts	☐	☐	☐	☐	☐
☐	☐	p.	Stables	☐	☐	☐	☐	☐
☐	☐	q.	Child play area(s)	☐	☐	☐	☐	☐

7. **If a central water system has been provided, please answer the following questions.**

   a. Name of organization supplying water: _____

   b. Current number of lots served by system (June 1977): _____

   c. Ultimate number of lots to be served by system: _____

   d. Source of water: _____

   e. Current usage (June 1977): _____ gallons/day

   f. Capacity of system _____ gallons/day

   g. Frequency of water quality checks: _____

   h. Agency conducting checks: _____

8. **If a central sewer system has been provided, please answer the following questions.**

   a. Name of organization operating system: _____

   b. Current number of lots served by system (June 1977): _____

   c. Ultimate number of lots to be served by system: _____

   d. Amount of sewage currently (June 1977) processed by treatment plant:

   _____ gallons/day

   e. Capacity of plant: _____ gallons/day

   f. Cost to consumer for extension and hook-up to central system:

   $ _____

9. **If central water and/or sewage disposal systems are not available to all or part of the project, what are the range of costs to lot owners for:**

   a. Drilling of individual well and pump: $_____ to $ _____

   b. Installation of septic or individual package system: $ _____ to $ _____

IV. CONSTRUCTION

1. **How many months in advance of lot sales to consumers/builders is infrastructure (e.g., roads, sewers, communications) development carried out?** (check)

   ☐ As "front-end" development one or more years ahead of sales and building development

   ☐ As a phased program less than one year ahead of sales and subsequent building development

   ☐ Other (please specify: _____)

2. **What are the size limits of a subdivision section you will consider developing at one time?**

   a. Limits:

   Minimum acres: _____

   Maximum acres: _____

   b. What are key determining factors:

   _____

   _____

3. **Please rate the importance of each of the following advantages and disadvantages of developing infrastructure well in advance of lot sales and building construction.**

	Very Important	Somewhat Important	Not Important
Advantages			
a. Achieve economies of scale	☐	☐	☐
b. Flexibility in meeting unforeseen demand	☐	☐	☐
c. Minimize later disruption of community	☐	☐	☐
d. Use excess cash	☐	☐	☐
e. Use excess construction capacity	☐	☐	☐
Disadvantages			
a. Increase financing costs	☐	☐	☐
b. Increase maintenance costs	☐	☐	☐
c. Increase environmental disruption	☐	☐	☐

   d. Other (please specify):

   _____

   _____

4. **What are/were the most critical problems you have encountered in infrastructure development?** (Rank 1 through 5: 1 = most critical; 2 = next most critical, etc.)

_____ a. Delays in governmental approvals

_____ b. Materials shortages

_____ c. Terrain obstacles

_____ d. Cost overruns

_____ e. Other (please describe: _____)

5. **How would you compare your construction performance in this project with your expectations?** (please circle)

		Worse Than Expected		As Expected		Better Than Expected
a.	Quality	1	2	3	4	5
b.	Timeliness	1	2	3	4	5
c.	Meeting cost goals	1	2	3	4	5
d.	Minimizing environmental disruption	1	2	3	4	5

6. **If construction performance did not meet your expectations in any way, how important were the following factors?** (please check)

		Very Important	Somewhat Important	Not Important
a.	Labor problems	☐	☐	☐
b.	Nonfamiliarity with mountain development	☐	☐	☐
c.	Government noncooperation	☐	☐	☐
d.	Unexpected competition	☐	☐	☐
e.	Tightening money market	☐	☐	☐

f. Other (please specify: _____

_____

_____

7. **What steps, if any, are being (were) taken to minimize environmental damage during the construction phases of this project?**

☐ None in particular

_____

_____

_____

_____

8. **During construction, have (were) any complaints been received from:**

Yes	No	
☐	☐	a. Adjacent landowners/residents
☐	☐	b. County or regional planning agencies
☐	☐	c. Environmental action groups
☐	☐	d. North Carolina state agencies
☐	☐	e. Other (please specify: _____)

9. **If any complaints were received, what was their nature and how were they handled?**

_____

_____

_____

V. MARKETING

1. **How effective have the following marketing methods been for this project?** (check)

Method	Using/Used with Good Results	Tried but Poor Results	Never Tried
a. In-house sales staff (personal selling)	☐	☐	☐
b. Radio advertising	☐	☐	☐
c. Television advertising	☐	☐	☐
d. Direct mail	☐	☐	☐
e. Newspapers (local)	☐	☐	☐
f. Newspapers (outside locality)	☐	☐	☐
g. Outdoor billboards	☐	☐	☐
h. Real estate brokers	☐	☐	☐
i. Other (please specify: _____)	☐	☐	☐

2. **What types of market research does your firm carry out?** (check)

Type	Frequency				
	Not Used	One-time Initial Study	Annually	Semi-Annually	Quarterly
a. Locational preference research	☐	☐	☐	☐	☐
b. Attitude survey of lot/housing preferences	☐	☐	☐	☐	☐
c. Regional and economic forecasting	☐	☐	☐	☐	☐
d. Basic trend analysis	☐	☐	☐	☐	☐
e. Other (specify: _____)	☐	☐	☐	☐	☐

3. **If actual marketing performance has not met expectations, please indicate the relative importance of each of the following contributing factors.**

☐ Check here if project has met expectations

Factors	Very Important	Somewhat Important	Not Important
a. **Market has not (did not) materialized**	☐	☐	☐
b. Downturn in market	☐	☐	☐
c. Poor market research	☐	☐	☐
d. Unexpected competition	☐	☐	☐
e. Tightening of money market	☐	☐	☐
f. Nonacceptance of project concept	☐	☐	☐
g. Other (please specify: _____)	☐	☐	☐

4. **What proportions of your lot sales are (were) made to customers living in the following states and regions?**

_____% North Carolina _____% Tennessee

_____% Florida _____% Virginia

_____% Georgia _____% Elsewhere

_____% South Carolina

100 %

5. **What is the price range of lots in this development?**

a. At project inception: $ _____ to $ _____

b. Currently (June 1977): $ _____ to $ _____

6. **What is the average price of detached leisure homes in this development?**

a. At project inception: $ _____

b. Currently: (New) $ _____ (Resales) $ _____

7. **What is the average price of condominium units in this development?**

☐ Not available

a. At project inception: $ _____

b. Currently: (New) $ _____ (Resales) $ _____

8. **Please estimate the proportion of lot buyers in this development that are in each of the following annual income categories:**

_____% Less than $10,000

_____% $10,000 to $17,499

_____% $17,500 to $24,499

_____% $25,000 to $49,999

_____% $50,000 or more

100 %

9. **Please estimate the age of the lot buyers in this development:**

_____% Less than 30 years

_____% 30 to 39 years

_____% 40 to 54 years

_____% 55 to 64 years

_____% 65 or older

100 %

10. **What proportion of lot buyers have constructed dwelling units on their lots (June 1977)?**

_____%

11. **Have any of the following factors discouraged home construction?** (check all that apply)

☐ a. Lack of local builders

☐ b. Buyers cannot afford to build

☐ c. Buyers bought for investment only

☐ d. Development is too far from buyers' primary homes

☐ e. High cost of building/financing

☐ f. Tight money

☐ g. Other (please specify: _____)

12. **Do you expect the annual rate of dwelling unit construction in this project to increase, remain about the same, or decrease?** (check)

☐ Increase

☐ Remain about the same

☐ Decrease

13. **What changes in the market potential do you foresee during the next ten years for the following types of development in the North Carolina mountains?**

	Expand	About the Same	Decrease
a. Unimproved recreational lots	☐	☐	☐
b. Improved leisure home subdivisions	☐	☐	☐
c. High-amenity leisure home communities	☐	☐	☐
d. Detached leisure homes	☐	☐	☐
e. Resort condominiums	☐	☐	☐
f. Time-sharing units	☐	☐	☐

14. **What do you see as the most important trends and market forces in residential land development in the North Carolina mountains?**

VI. COMMUNITY RELATIONS

1. **What are the main community programs and services that you are providing or have planned for this project — e.g., security service, trash and garbage collection, cable television, etc.? What roles have you played in providing or ensuring the provision of these services?**

Programs/Services	Developer Role
☐ None	☐ None
(1) _____	_____
(2) _____	_____
(3) _____	_____
(4) _____	_____
(5) _____	_____

2. **If a property owners association has been established for this project, please indicate the following:**

   a. Association president/manager: _____

      Address: _____

      Telephone number: _____

   b. Assessment: $ _____ per month or $ _____ per year

   c. When was (will be) responsibility for community facilities and programs transferred from the developer to the association?

      _____

   d. What is the association's annual budget? $ _____

   e. What proportion of the association's annual budget is subsidized by the developer?

      _____%

   f. How is the developer represented in the organization?

      _____

      _____

      _____

3. **What (other) formal or informal mechanisms have been established for communications and decision making with resident groups?**

   ☐ None

   _____

   _____

   _____

VII. OVERALL ASSESSMENT

1. **Would you undertake another residential development project in the North Carolina mountain region?**

   ☐ Yes

   ☐ No

   a. If yes, what are the major advantages that make this business particularly attractive?

   _____

   _____

   _____

   b. If no, why not?

   _____

   _____

2. **Are you actively seeking sites for additional projects in the mountain region?**

   ☐ Yes

   ☐ No

3. **What do you consider to be the most important problems affecting the residential development industry?**

   (1) _____

   (2) _____

   (3) _____

4. **What changes do you foresee during the coming ten years in the following factors of importance to residential land development?** (check)

Factor	Change in Factor		
	Less	Same	Greater
a. Acceptance by local communities	☐	☐	☐
b. Local land use and building regulation	☐	☐	☐
c. State land use and building regulation	☐	☐	☐
d. Enforcement of environmental regulations	☐	☐	☐
e. Availability of development financing	☐	☐	☐
f. Cost of development	☐	☐	☐

5. **In your opinion, will increasing coverage and enforcement of the following governmental regulations have a desirable, undesirable, or no effect on the residential development industry?** (check)

Regulation	Desirable Effect	No Effect	Undesirable Effect
a. County subdivision regulations	☐	☐	☐
b. County zoning	☐	☐	☐
c. County building permits	☐	☐	☐
d. County sedimentation pollution control ordinance	☐	☐	☐
e. County floodway ordinance	☐	☐	☐
f. County environmental impact statement requirement	☐	☐	☐
g. State regulation of development in areas of environmental concern	☐	☐	☐

6. **Please use the space below to make any comments about residential development in the North Carolina mountains which you believe to be significant, including those that you may not have elaborated upon fully elsewhere in this questionnaire.**

_____

_____

_____

_____

_____

_____

7. **Person completing questionnaire:**

Name _____

Position _____

Phone _____

APPENDIX B

SURVEY OF PUBLIC OFFICIALS: MOUNTAIN REGION, SUMMER 1977

QUESTIONNAIRE

County: _____ Interview No. _____

CONFIDENTIAL

WATER RESOURCE CONSEQUENCES OF RECREATIONAL LAND DEVELOPMENT

Survey of Public Officials

Respondent's Name: _____ Interviewer: _____

Position: _____ Date: _____

Organization: _____ Place of Interview: _____

Address: _____ _____

City: _____ _____

Telephone Number: _____ Time of Interview: _____

* * * * * * * * * * * * * * *

Hello. I'm from the Center for Urban and Regional Studies of The University of North Carolina at Chapel Hill. We are conducting a study of residential development practices and outcomes in North Carolina. One of the most important aspects of the study concerns the perceptions and attitudes of persons like yourself who hold positions of responsibility in local government. As you answer the following questions, please keep in mind that no direct quotes will be used without your permission. However, data gathered will be used in reports and published as part of the research. Of course, you are not required to participate, but I hope very much that you will and I think that you will find it interesting.

* * * * * * * * * * * * * * *

Center for Urban and Regional Studies
The University of North Carolina at Chapel Hill

Summer 1977

Characteristics of the Residential Development Industry

To start the interview, I have a series of questions about the status of residential land development in your county.

1. First, what would you say are the major advantages that make this county attractive for recreational and leisure home land development?

_____

_____

_____

_____

2. Are there any characteristics of the county that have discouraged or inhibited recreational and leisure home land development?

☐ No

☐ Yes

a. (IF YES) What are these characteristics?

_____

_____

_____

3. How many firms would you estimate are engaged in residential land development in the county at this time?

_____ Number of firms

4. What proportion of these firms would you say are local companies operated by local persons, and what proportion are companies that have moved into the county from somewhere else?

_____% Local firms

_____% Outside firms

5. During the past five years, that is, since the summer of 1972, has the number of residential developers that are active in the county increased markedly, increased slightly, remained about the same, or decreased?

☐ Increased markedly

☐ Increased slightly

☐ Remained about the same

☐ Decreased

6. What are your expectations for the next five years? Do you expect that the number of residential developers that are active in the county will increase markedly, increase slightly, remain about the same, or decrease?

___ Increase markedly (ASK a)

___ Increase slightly (ASK a)

___ Remain about the same

___ Decrease (ASK a)

a. What factors do you think will contribute to an (increase/decrease) in the number of residential development firms that will be operating in the county?

_____

_____

_____

7. A recent inventory of subdivisions in unincorporated sections of Watauga County indicated that 129 subdivisions of five acres or more had been recorded since 1950 and that almost 10,000 lots had been created. Although such estimates are difficult to make, how many residential subdivisions of more than five acres and how many residential lots would you say there are in unincorporated sections of this county?

_____ Estimated number of subdivisions

_____ Estimated number of residential lots

8. The Watauga County inventory also revealed that over 70 percent of the acreage that had been subdivided in the county was in only eight subdivisions of 100 or more acres. Could you name any large projects of that type in this county? Who is the developer?

☐ None

Major Residential Projects	Name of Developer
(a) _____	_____
(b) _____	_____
(c) _____	_____
(d) _____	_____
(e) _____	_____

9. Would you say that the probability of (additional) large subdivisions of 100 or more acres being developed in the county during the next five years is very high, high, medium, or low?

☐ Very high probability

☐ High probability

☐ Medium probability

☐ Low probability

a. Why is that?

_____

_____

_____

Impacts of Residential Land Development

A number of persons have been concerned about the impacts of recreational and leisure home development on mountain counties. However, little information has been available about the incidence of specific problems resulting from land development activities. In this next section, I will ask you about your knowledge of specific problem situations, and then I would like your estimate of how serious the problem is likely to become over the next ten years.

10. First, what about sewage disposal? Do you know of any cases of septic tank failures in leisure home or recreational land development projects? . . . Where did that occur?. . . Why did it occur?. . . What about . . . .

Problems	Description of Occurrence
a. Septice tank failures	_____
☐ Yes	_____
☐ No	_____
b. Package treatment plant failures or overloading	_____
☐ Yes	_____
☐ No	_____
c. Pollution of wells or groundwater from septic tanks	_____
☐ Yes	_____
☐ No	_____

Problems	Description of Occurrence
d. Shortages of groundwater/deeper well depths due to excessive pumping of groundwater	
☐ Yes	
☐ No	
e. Soil erosion during road and other construction activities	
☐ Yes	
☐ No	
f. Continuing erosion because of inadequate drainage systems	
☐ Yes	
☐ No	
g. Stream or lake sedimentation and turbidity from sediment originating in subdivisions	
☐ Yes	
☐ No	
h. Bank erosion and channel scouring due to increased stormwater run-off from subdivisions	
☐ Yes	
☐ No	
i. Increased flood frequencies in areas downstream from subdivisions	
☐ Yes	
☐ No	
j. Landslides or mudflows from construction on steep slopes and poor soils	
☐ Yes	
☐ No	

Problems	Description of Occurrence
k. Air pollution from increased automobile traffic	
☐ Yes	
☐ No	
l. Destruction of rare or endangered plants or animal habitats	
☐ Yes	
☐ No	
m. Increased roadside litter along roads leading to subdivisions	
☐ Yes	
☐ No	
n. Destruction of unique views and scenic vistas	
☐ Yes	
☐ No	
o. Road washouts and gullying due to construction on steep slopes	
☐ Yes	
☐ No	
p. Flooding of lots and homes located adjacent to streams and rivers	
☐ Yes	
☐ No	
q. Are there any other problems that that you have observed	
☐ Yes (specify:_____ _____)	
☐ No	

11. Now, I would like you to estimate how serious each of these problems is likely to become over the next ten years. Do you think that septic tank failures in recreational and leisure home subdivisions will become a serious problem, a problem, but not serious, or will not be a problem? What about. . . .

Problems	Serious	A Problem	Not a Problem
a. Septic tank failures	☐	☐	☐
b. Package treatment plant failures or overloading	☐	☐	☐
c. Pollution of wells or groundwater from septic tanks	☐	☐	☐
d. Shortages of groundwater/deeper well depths due to excessive pumping of groundwater	☐	☐	☐
e. Soil erosion during road and other construction activities	☐	☐	☐
f. Continuing erosion because of inadequate drainage systems	☐	☐	☐
g. Stream or lake sedimentation and turbidity from sediment originating in subdivisions	☐	☐	☐
h. Bank erosion and channel scouring due to increased stormwater runoff from subdivisions	☐	☐	☐
i. Increased flood frequencies in areas downstream from subdivisions	☐	☐	☐
j. Landslides or mudflows from construction on steep slopes and poor soils	☐	☐	☐
k. Air pollution from increased automobile traffic	☐	☐	☐
l. Destruction of rare or endangered plants or animal habitats	☐	☐	☐
m. Increased roadside litter along roads leading to subdivisions	☐	☐	☐
n. Destruction of unique views and scenic vistas	☐	☐	☐

Problems	Serious	A Problem	Not a Problem
o. Road washouts and gullying due to construction on steep slopes	☐	☐	☐
p. Flooding of lots and homes located adjacent to streams and rivers	☐	☐	☐
q. Other problems (specify: _____ _____)	☐	☐	☐

12. There have been reports indicating that leisure home and recreational land development is causing land to increase in value to such an extent that it can no longer be purchased by a growing number of existing county residents. Is this occurring in your county?

☐ Yes

☐ No

a. (IF YES) What do you think can be done about it?

_____

_____

_____

13. During the past five years, has public demand for any of the following county services increased because of recreational and leisure home development? What about. . .

a. Police protection?

☐ Yes

☐ No

b. Fire protection?

☐ Yes

☐ No

c. Solid waste collection and disposal?

☐ Yes

☐ No

14. (IF YES) What steps has the county taken to meet this demand for increased services?

a. Service change:

_____

_____

b. Service change:

_____

_____

c. Service change:

_____

_____

d. Planning and land use regulation?

☐ Yes

☐ No

d. Service change:

_____

_____

e. Welfare services due to seasonal unemployment?

☐ Yes

☐ No

e. Service change:

_____

_____

f. Health care for older residents?

☐ Yes

☐ No

f. Service change:

_____

_____

g. Emergency health care and treatment?

☐ Yes

☐ No

g. Service change:

_____

_____

h. Parks and recreation?

☐ Yes

☐ No

h. Service change:

_____

_____

i. Building, plumbing, electrical inspection?

☐ Yes

☐ No

i. Service change:

_____

_____

15. Have increased property tax revenues from leisure home and recreational land development exceeded the costs of providing (additional) county services, about met the costs of services, or fallen short of service costs?

☐ Exceeded service costs

☐ Met service costs

☐ Fallen short of service costs

16. And what about the effects of leisure home and recreational land development on employment? Would you estimate that construction, finance, and other employment associated with the land development industry is of critical importance in the county's economy, is important to the county's economy but not critical, or is not important to the county's economy?

☐ Critical importance

☐ Important, but not critical

☐ Not important

a. Why do you say that?

_____

_____

_____

17. There have been some reports that recreational land development interferes with farming, by pricing land out of the reach of farmers and by removing land from productive agricultural use. On the other hand, recreational land development provides farmers with a market for the sale of marginal farm, grazing, and timber lands. Considering these two effects, do you believe that recreational land development has had a net positive effect, net negative effect, or no effect on farming and farm families in this county?

☐ Positive effect on farmers and farming

☐ Negative effect on farmers and farming

☐ No effect on farmers and farming

18. In your opinion, has leisure home and recreational land development in the county resulted in an increase in any of the following social problems. . .

a. Crimes, such as vandalism and burglary

☐ Yes

☐ No

b. Unemployment

☐ Yes

☐ No

c. Traffic congestion

☐ Yes

☐ No

d. Crowding and overuse of existing county facilities and services, such as hospitals and park and recreational facilities

☐ Yes

☐ No

e. Conflict between leisure home and native county residents over county services and programs

☐ Yes

☐ No

19. We are also interested in how native residents feel about new people coming into the county to occupy units in leisure home and recreational development projects? What percent of the native residents would you estimate welcome an influx of new people with different lifestyles and attitudes; have mixed feelings about the new residents; and resent outsiders moving into the county?

_____% Welcome new residents

_____% Have mixed feelings about new residents

_____% Resent new residents

100%

20. Considering everything we have discussed to this point, do you feel that, overall, leisure home and recreational land development has been beneficial for the county, that it is too early to say, or that, on net, development has not been beneficial for the county?

☐ Beneficial for county

☐ Too early to say

☐ Not beneficial for county

a. What are the most important reasons for this conclusion?

_____

_____

_____

Public Regulation of Development

The next section of the interview focuses on land use planning and regulation in the county.

21. First, has the county organized a planning board?

☐ Yes

☐ No

a. (IF NO) Why has the county stayed away from establishing a land use planning process?

_____

_____

_____

b. (IF YES) How active is the planning board? What has it done?

_____

_____

_____

c. (IF YES) To what extent have the activities of the planning board been supported by the county commissioners and county residents?

_____

_____

_____

22. Next, could you tell me whether each of the following types of regulations has been adopted by the county, and, if so, when it was first adopted, and the circumstances surrounding the county's decision to enact this type of regulation. What about. . .

a. Zoning regulations

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

b. Subdivision regulations

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

c. Floodway/floodplain ordinance

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

d. Sedimentation pollution control ordinance

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

e. Building code

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

f. Environmental impact statement requirement

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

23. How many persons have been assigned to enforce these regulations?

☐ Not applicable - no regulations

_____ Number of persons

24. A number of reasons have been given for counties' reluctance to regulate land use and land development. How would you rank the following four reasons as an explanation for this county's reluctance to act:

Rank 1 through 4 (1 = most important, 2 next most important, etc.)

_____ Dominant philosophy in county stresses individual self-reliance and resistance to government control over property

_____ Cost of enforcing regulations is (was) beyond county's fiscal resources

_____ Problems from development are (were) not serious enough to stimulate county action

_____ County officials are (were) involved in or served the land development industry and resist(ed) government regulation

25. The State of North Carolina is responsible for the enforcement of two types of regulations--septic tank permits and sedimentation pollution control--in most counties. How effective has the regulation of septic tanks been in this county in preventing septic tank problems--very effective, somewhat effective, or not effective?

☐ Very effective

☐ Somewhat effective

☐ Not effective

a. What factors led you to this opinion?

_____

_____

_____

26. And how about enforcement of the State's sedimentation pollution control regulations. Would you say that State regulation has been very effective, somewhat effective, or not effective in preventing erosion and sedimentation from land disturbing activities in this county?

☐ Very effective

☐ Somewhat effective

☐ Not effective

a. What factors led you to this opinion?

_____

_____

_____

27. Do you have any ideas how these regulations could be made to work better in your county?

☐ None

_____

_____

_____

28. Roads being constructed in a number of leisure home and recreational land development projects do not meet State standards and will not be accepted for State maintenance. This practice is permitted by some county subdivision regulations in order to reduce the cost and environmental disruption of development on steep slopes. What types of problems, if any, have accompanied the use of private roads in this county?

☐ None

_____

_____

_____

29. Do you believe that the State should develop and adopt special standards for mountain subdivisions that would allow smaller, less environmentally disruptive roads to be constructed and accepted for State maintenance in mountain and hillside subdivisions?

☐ Yes

☐ No

a. (IF NO) Why is that?

_____

_____

_____

30. How do you feel about the following State land use and land development activities? First, are you in favor of State regulations which make county land classification planning mandatory?

☐ Yes

☐ No

a. Why is that?

_____

_____

b. (IF NO, ALSO ASK) Would you favor such a regulation if State financial and technical assistance were made available to do the planning?

☐ Yes

☐ No

31. Some states have passed legislation which makes local land use regulation mandatory? Do you believe that similar legislation should be enacted by the State of North Carolina?

☐ Yes

☐ No

a. Why is that?

_____

_____

_____

32. Do you believe that the State of North Carolina should require permits for land development projects over a certain size in areas of environmental concern in the mountain region?

☐ Yes

☐ No

a. Why is that?

_____

_____

_____

b. (IF YES) To what types of land should a permit system be applied?

_____

_____

_____

33. Do you believe that the State of North Carolina should attempt to protect consumer interests through any of the following types of land sales regulations? What about. . .

a. State registration of residential subdivisions and requirements for full disclosure of project characteristics to prospective buyers?

☐ Yes

☐ No

b. State registration of residential subdivisions and State requirements of performance bonds to insure the construction of promised subdivision improvements?

☐ Yes

☐ No

c. State registration of residential subdivisions and State provision for consumers' rights of recision during a specified period?

☐ Yes

☐ No

34. Would you favor local administration of any of these regulations?

☐ Yes

☐ No

a. (IF YES) Which ones?

☐ Full disclosure

☐ Performance bonding

☐ Recision rights

35. Has the county received any assistance with land use planning or regulation from the Department of Natural and Economic Resources and/or from this region's council of governments?

☐ Yes, from DNER

☐ Yes, from COG

☐ No

a. (IF YES) What types of assistance were provided?

DNER: _____

_____

COG: _____

_____

36. If you need planning assistance in the future, which agency would you turn to first for assistance--the State Department of Natural and Economic Resources or the Council of Governments?

☐ DNER

☐ COG

☐ Neither, depends

a. Why is that?

_____

_____

_____

37. Before concluding the interview, are there any additional comments you would care to make about leisure home and recreational land development in this county, the effects of development on the county, or the county's activities in planning for and regulating development?

☐ None

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR ASSISTANCE

APPENDIX C

SURVEY OF PUBLIC OFFICIALS: COASTAL REGION, WINTER 1978

County or Community: _____ Interview No. _____

CONFIDENTIAL

WATER RESOURCE CONSEQUENCES OF RECREATIONAL LAND DEVELOPMENT

Survey of Public Officials

Respondent's Name: _____ Interviewer: _____

Position: _____ Date: _____

Organization: _____ Place of Interview: _____

Address: _____ _____

City: _____ _____

Telephone Number: _____ Time of Interview: _____

* * * * * *

Hello, I'm from the Center for Urban and Regional Studies of The University of North Carolina at Chapel Hill. We are conducting a study of residential development practices and outcomes in North Carolina. One of the most important aspects of the study concerns the perceptions and attitudes of persons like yourself who hold positions of responsibility in local government. As you answer the following questions, please keep in mind that no direct quotes will be used without your permission. However, data gathered will be used in reports and published as part of the research. Of course, you are not required to participate, but I hope very much that you will and I think that you will find it interesting.

* * * * * *

Center for Urban and Regional Studies
The University of North Carolina at Chapel Hill

Winter 1978

Characteristics of the Residential Development Industry

To start the interview, I have a series of questions about the status of recreational land development in your county (community).

1. First, what would you say are the major advantages that make this county (community) attractive for recreational and leisure home land development?

_____

_____

_____

_____

2. Are there any characteristics of the county (community) that have discouraged or inhibited recreational and leisure home land development?

☐ No

☐ Yes

a. (If Yes) What are these characteristics?

_____

_____

_____

3. How many firms would you estimate are engaged in recreational land development in the county (community) at this time?

_____ Number of firms

4. What proportion of these firms would you say are local companies operated by local persons, and what proportion are companies that have moved into the county (community) from somewhere else?

_____% Local firms

_____% Outside firms

5. During the past five years, that is, since the summer of 1972, has the number of recreational developers that are active in the county (community) increased markedly, increased slightly, remained about the same, or decreased?

☐ Increased markedly

☐ Increased slightly

☐ Remained about the same

☐ Decreased

6. What are your expectations for the next five years? Do you expect that the number of recreational developers that are active in the county (community) will increase markedly, increase slightly, remain about the same, or decrease?

___ Increase markedly (Ask a)

___ Increase slightly (Ask a)

___ Remain about the same

___ Decrease (Ask a)

a. What factors do you think will contribute to an (increase/decrease) in the number of development firms that will be operating in the county (community)?

_____

_____

_____

7. Although such estimates are difficult to make, how many recreational subdivisions of more than five acres and how many recreational residential lots would you say there are in this county (community)?

_____ Estimated number of subdivisions

_____ Estimated number of residential lots

8. Could you name any large recreational residential projects in this county (community)? Who is the developer?

☐ None

Major Residential Projects	Name of Developer
(a) _____	_____
(b) _____	_____
(c) _____	_____
(d) _____	_____
(e) _____	_____
(f) _____	_____
(g) _____	_____
(h) _____	_____

9. Would you say that the probability of (additional) large subdivisions of 100 or more acres being developed in the county (community) within the next five years is very high, high, medium, or low?

☐ Very high probability

☐ High probability

☐ Medium probability

☐ Low probability

a. Why is that?

_____

_____

_____

Impacts of Residential Land Development

A number of persons have been concerned about the impacts of recreational and leisure home development on coastal counties (communities). However, little information has been available about the incidence of specific problems resulting from land development activities. In this next section, I will ask you about your knowledge of specific problem situations, and then I would like your estimate of how serious the problem is likely to become over the next ten years.

10. First, what about sewage disposal? Do you know of any cases of septic tank failures in leisure home or recreational land development projects? . . . Where did that occur? . . . Why did it occur? . . . What about . . .

Problems	Description of Occurrence
a. Septic tank failures?	
☐ Yes	
☐ No	
b. Package treatment plant failures or overloading?	
☐ Yes	
☐ No	
c. Pollution of wells or groundwater from septic tanks?	
☐ Yes	
☐ No	
d. Closing of shellfish beds due to pollution from septic tanks?	
☐ Yes	
☐ No	
☐ NA	

Problems	Description of Occurrence
e. Eutrophication (algae blooms) of tidal creeks due to increased nutrients from septic tank seepage?	
☐ Yes	
☐ No	
☐ NA	
f. Shortages of groundwater/deeper well depths due to excessive pumping of groundwater?	
☐ Yes	
☐ No	
☐ NA	
g. Salt intrusion into groundwater due to excessive pumping?	
☐ Yes	
☐ No	
☐ NA	
h. Where needed, public water and sewer treatment not available or inadequate?	
☐ Yes	
☐ No	
i. Town(s) facing difficulties in paying operating and maintenance costs on public utilities during off season?	
☐ Yes	
☐ No	

Problems	Description of Occurrence
j. Road overwash, roadside erosion, and damage to maritime forests due to salt intrusions through open cuts of roads constructed perpendicular to shoreline?	
☐ Yes	
☐ No	
☐ NA	
k. Road congestion occurring at peak travel times?	
☐ Yes	
☐ No	
l. Road washouts due to erosion?	
☐ Yes	
☐ No	
m. Roads improperly constructed by developers; state or towns unwilling to take over maintenance?	
☐ Yes	
☐ No	
n. Roadside litter?	
☐ Yes	
☐ No	
o. Relic dune reactivation due to cutting of vegetation?	
☐ Yes	
☐ No	
☐ NA	

Problems	Description of Occurrence
p. Reduced holding capacity of fresh water aquifer due to construction and paving?	
☐ Yes	
☐ No	
q. Vegetation death and erosion due to excessive thinning of protective cover?	
☐ Yes	
☐ No	
r. Primary dune destruction due to recreational and leisure home construction activity?	
☐ Yes	
☐ No	
☐ NA	
s. Shoreline erosion due to failure of groins and seawalls?	
☐ Yes	
☐ No	
☐ NA	
t. Erosion of shorefront property due to construction of nearby seawalls, groins, and bulkheads?	
☐ Yes	
☐ No	
☐ NA	

Problems	Description of Occurrence
u. Potential property loss due to inadequate residential construction practices?	
☐ Yes	
☐ No	
v. Potential property damage because of inadequate mobile home tie down and poor mobile home location?	
☐ Yes	
☐ No	
w. Inadequate public parking for beach users?	
☐ Yes	
☐ No	
☐ NA	
x. Overcrowding of parks and other public recreation areas?	
☐ Yes	
☐ No	
☐ NA	
y. Underutilization of parks and other public recreation areas due to inaccessible location?	
☐ Yes	
☐ No	
☐ NA	

Problems	Description of Occurrence
z. Conflict between private property owners and persons using their land for access to the beach?	
☐ Yes	
☐ No	
☐ NA	
aa. Sand dune erosion due to lack of protective access ramps for foot and vehicle traffic?	
☐ Yes	
☐ No	
☐ NA	
bb. Inadequate access to waterfront from nonwaterfront lots in coastal subdivisions?	
☐ Yes	
☐ No	
☐ NA	
cc. Dredge and fill activities completed without necessary permits?	
☐ Yes	
☐ No	
☐ NA	
dd. Collection of septic tank runoff by finger canals?	
☐ Yes	
☐ No	
☐ NA	

Problems	Description of Occurrence
ee. Wetlands and estuarine waters adversely impacted by dredge spoils?	
☐ Yes	
☐ No	
☐ NA	
ff. Mosquitos breeding on dredge spoil islands?	
☐ Yes	
☐ No	
☐ NA	
gg. Salt intrusion into water supplies due to dredging too close to wells?	
☐ Yes	
☐ No	
☐ NA	
hh. Destruction of nesting areas for various bird populations?	
☐ Yes	
☐ No	
☐ NA	
ii. Reduction of populations of fish and shellfish as a result of dredging?	
☐ Yes	
☐ No	
☐ NA	

Problems	Description of Occurrence
jj. Lower water table, increased salinity, vegetative changes due to drainage canals in recreation subdivisions?	
☐ Yes	
☐ No	
☐ NA	
kk. Are there any other problems that you have observed?	
☐ Yes (specify: _____	
_____)	
☐ No	

11. Now, I would like you to estimate how serious each of these problems is likely to become over the next ten years. Please indicate for each problem (hand respondent sheet A) whether you think it will be a serious problem, a problem, but not serious, or will not be a problem. What about . . .

Problems	Serious	A Problem	Not a Problem
a. Septic tank failures	☐	☐	☐
b. Package treatment plant failures or overloading	☐	☐	☐
c. Pollution of wells or groundwater from septic tanks	☐	☐	☐
d. Closing of shellfish beds due to pollution from septic tanks	☐	☐	☐
e. Eutrophication (algae blooms) of tidal creeks due to increased nutrients from septic tanks	☐	☐	☐
f. Shortages of groundwater/deeper well depths due to excessive pumping of groundwater	☐	☐	☐
g. Salt intrusion into groundwater due to excessive pumping	☐	☐	☐

Problems	Serious	A Problem	Not a Problem
h. Where needed, public water and sewer treatment not available or inadequate	☐	☐	☐
i. Town unable to pay operating and maintenance costs of public utilities during off season	☐	☐	☐
j. Overwash zones, roadside erosion, and damage to maritime forests due to salt intrustion through open cuts of roads constructed perpendicular to shoreline	☐	☐	☐
k. Road congestion occurring at peak travel times	☐	☐	☐
l. Road washouts due to erosion	☐	☐	☐
m. Roads improperly constructed by developers; state or towns unwilling to take over maintenance	☐	☐	☐
n. Roadside litter	☐	☐	☐
o. Relic dune reactivation due to cutting of vegetation	☐	☐	☐
p. Reduced holding capacity of fresh water aquifer due to construction or paving	☐	☐	☐
q. Vegetation death and erosion due to excessive thinning of protective cover	☐	☐	☐
r. Primary dune destruction due to inadequate enforcement of Sand Dune Protection Ordinance	☐	☐	☐
s. Shoreline erosion due to failure of groins and seawalls	☐	☐	☐
t. Erosion of shorefront property due to construction of nearby seawalls, groins, and bulkheads	☐	☐	☐

Problems	Serious	A Problem	Not a Problem
u. Property loss due to inadequate residential construction practices	☐	☐	☐
v. Property damage because of inadequate mobile home tie downs and poor mobile home locations	☐	☐	☐
w. Inadequate public parking for beach users	☐	☐	☐
x. Overcrowding of parks and other public recreation areas	☐	☐	☐
y. Underutilization of parks and other public recreation areas due to inaccessible location	☐	☐	☐
z. Conflict between private property owners and persons using their land for access to the beach	☐	☐	☐
aa. Sand dune erosion due to lack of protective access ramps for foot and vehicle traffic	☐	☐	☐
bb. Inadequate access to waterfront from nonwaterfront lots in coastal subdivisions	☐	☐	☐
cc. Dredge and fill activities completed without receiving necessary permits	☐	☐	☐
dd. Collection of septic tank runoff by finger canals	☐	☐	☐
ee. Wetlands and estuarine waters adversely impacted by dredge spoils	☐	☐	☐
ff. Mosquitos breeding on dredge spoil islands	☐	☐	☐
gg. Salt intrusion into water supplies due to dredging too close to wells	☐	☐	☐
hh. Destruction of nesting areas for various bird populations	☐	☐	☐

Problems	Serious	A Problem	Not a Problem
ii. Reduction of populations of fish and shellfish as a result of dredging	☐	☐	☐
jj. Lower water table, increased salinity, vegetative changes due to drainage canals in recreation subdivisions	☐	☐	☐
kk. Other problems (specify: _____)	☐	☐	☐

12. There have been reports indicating that leisure home and recreational land development is causing land to increase in value to such an extent that it can no longer be purchased by a growing number of existing county (community) residents. Is this occurring in your county (community)?

☐ Yes

☐ No

a. (If Yes) What do you think can be done about it?

_____

_____

_____

13. During the past five years, has public demand for any of the following county (community) services increased because of recreational and leisure home development? What about . . .

a. Police protection?

☐ Yes

☐ No

b. Fire protection?

☐ Yes

☐ No

14. (If Yes) What steps has the county (community) taken to meet this demand for increased services?

a. Service change:

_____

_____

b. Service change:

_____

_____

c. Solid waste collection and disposal?

☐ Yes

☐ No

c. Service change:

_____

_____

d. Planning and land use regulation?

☐ Yes

☐ No

d. Service change:

_____

_____

e. Welfare services due to seasonal unemployment?

☐ Yes

☐ No

e. Service change:

_____

_____

f. Health care for older residents?

☐ Yes

☐ No

f. Service change:

_____

_____

g. Emergency health care and treatment?

☐ Yes

☐ No

g. Service change:

_____

_____

h. Parks and recreation?

☐ Yes

☐ No

h. Service change:

_____

_____

i. Building, plumbing, electrical inspection?

☐ Yes

☐ No

i. Service change:

_____

_____

j. Mosquito control?

☐ Yes

☐ No

j. Service change:

_____

_____

15. Have increased property tax revenues from leisure home and recreational land development exceeded the costs of providing (additional) county (community) services, about met the costs of services, or fallen short of service costs?

☐ Exceeded service costs

☐ Met service costs

☐ Fallen short of service costs

16. And what about the effects of leisure home and recreational land development on employment? Would you estimate that construction, finance, and other employment associated with the land development industry is of critical importance in the county's (community's) economy, is important to the county's (community's) economy but not critical, or is not important to the county's (community's) economy?

☐ Critical importance

☐ Important, but not critical

☐ Not important

a. Why do you say that?

_____

_____

_____

17. There have been some reports that recreational land development interferes with farming, by pricing land out of the reach of farmers and by removing land from productive agricultural use. On the other hand, recreational land development provides farmers with a market for the sale of marginal farm, grazing, and timber lands. Considering these two effects, do you believe that recreational land development has had a net positive effect, net negative effect, or no effect on farming and farm families in the county (community)?

☐ Positive effect on farmers and farming

☐ Negative effect on farmers and farming

☐ No effect on farmers and farming

☐ Not applicable, no farming in county/community

18. There have also been reports of conflicts between recreational land development and commercial fishing. Has recreational land development interfered with commercial fishing activities in the county (community) or do you think recreational land development has had a positive effect on fishing activities, or no effect?

- ☐ Positive effect on commercial fishing
- ☐ Negative effect on commercial fishing
- ☐ No effect on commercial fishing
- ☐ Not applicable, no commercial fishing in community/county

19. In your opinion, has leisure home and recreational land development in the county (community) resulted in an increase in any of the following social problems . . .

a. Crimes, such as vandalism and burglary?

- ☐ Yes
- ☐ No

b. Unemployment?

- ☐ Yes
- ☐ No

c. Crowding and overuse of existing county (community) facilities and services, such as hospitals and park and recreational facilities?

- ☐ Yes
- ☐ No

d. Traffic congestion?

- ☐ Yes
- ☐ No

e. Conflict between leisure home and native county (community) residents over county (community) services and programs?

- ☐ Yes
- ☐ No

20. We are also interested in how native residents feel about new people coming into the county (community) to occupy units in leisure home and recreational development projects? What percent of the native residents would you estimate welcome an influx of new people with different lifestyles and attitudes; have mixed feelings about the new residents; and resent outsiders moving into the county (community)?

_____% Welcome new residents

_____% Have mixed feelings about new residents

_____% Resent new residents

_____
100%

21. Considering everything we have discussed to this point, do you feel that, overall, leisure home and recreational land development has been beneficial for the county (community), that it is too early to say, or that, on net, development has not been beneficial for the county (community)?

☐ Beneficial for county (community)

☐ Too early to say

☐ Not beneficial for county (community)

a. What are the most important reasons for this conclusion?

_____

_____

_____

Public Regulation of Development

The next section of the interview focuses on land use planning and regulation in the county (community).

22. First, has the county (community) organized a planning board?

☐ Yes

☐ No

a. (If No) Why has the county (community) stayed away from establishing a land use planning board?

_____

_____

b. (If No) How did it prepare its land use plan required under the Coastal Area Management Act?

_____

_____

_____

c. (If Yes) How active is the planning board? What has it done?

_____

_____

_____

d. (If Yes) To what extent have the activities of the planning board been supported by the county commissioners/town aldermen?

_____

_____

_____

e. (If Yes) And to what extent have the activities of the planning board been supported by county (community) residents?

_____

_____

_____

23. Next, could you tell me whether each of the following types of regulations has been adopted by the county (community) and, if so, when it was first adopted, and the circumstances surrounding the county's (community's) decision to enact this type of regulation. What about . . .

a. Zoning regulations?

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

b. Subdivision regulations?

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

c. Floodway/floodplain ordinance?

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

d. Sedimentation pollution control ordinance?

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

e. Building code?

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted:

(2) Circumstances: _____

_____

f. Sand dune protection ordinance?

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

g. Environmental impact statement requirement?

☐ Not adopted

(1) Why? _____

_____

☐ Adopted

(1) Year first adopted: _____

(2) Circumstances: _____

_____

(3) Current status: _____

_____

24. How many persons have been assigned to enforce these regulations:

☐ Not applicable - no regulations

_____ Number of persons

25. A number of reasons have been given for counties' (communities') reluctance to regulate land use and land development. How would you rank the following four reasons as an explanation for this county's (community's) reluctance to act (more vigorously):

Rank 1 through 4 (1 = most important, 2 next most important, etc.)

_____ Dominant philosophy in county (community) stresses individual self-reliance and resistance to government control over property

_____ Cost of enforcing regulations is (was) beyond county's (community's) fiscal resources

_____ Problems from development are (were) not serious enough to stimulate county (community) action

_____ County (community) officials are (were) involved in or served the land development industry and resist(ed) government regulation

26. The State of North Carolina has adopted rules and regulations for septic tanks, sedimentation pollution, and dredge and fill activities that affect coastal counties (communities). The next series of questions focus on the effectiveness of these standards. How effective has the regulation of septic tanks been in this county in preventing septic tank problems--very effective, somewhat effective, or not effective?

☐ Very effective

☐ Somewhat effective

☐ Not effective

a. What factors led you to this opinion?

_____

_____

_____

27. How about enforcement of the State's sedimentation pollution control regulations? Would you say that State regulations has been very effective, somewhat effective, or not effective in preventing erosion and sedimentation from land disturbing activities in this county (community)?

☐ Very effective

☐ Somewhat effective

☐ Not effective

a. What factors led you to this opinion?

_____

_____

_____

28. And finally, what about enforcement of the State's dredge and fill regulations? Would you say that State regulations has been very effective, somewhat effective, or not effective in preventing problems from dredging and filling in this county (community)?

☐ Very effective

☐ Somewhat effective

☐ Not effective

a. What factors led you to this opinion?

_____

_____

_____

29. Do you have any ideas how these regulations could be made to work better in your county (community)? What about . . .

☐ None

a. Septic Tank Regulations: _____

_____

b. Sedimentation Pollution Control Regulations: _____

_____

c. Dredge and Fill Regulations: _____

_____

30. Roads being constructed in a number of leisure home and recreational land development projects do not meet State standards and will not be accepted for State maintenance. This practice is permitted by some county (community) subdivision regulations in order to reduce the cost and environmental disruption of development on the coastal ecosystem. What types of problems, if any, have accompanied the use of private roads in this county (community)?

☐ None

_____

_____

_____

31. Do you believe that the State should develop and adopt special standards for coastal subdivisions that would allow smaller, less environmentally disruptive roads to be constructed and accepted for State maintenance in seashore subdivisions?

☐ Yes

☐ No

a. (If No) Why is that?

_____

_____

_____

32. Do you believe that the State of North Carolina should attempt to protect consumer interests through any of the following types of land sales regulations? What about . . .

a. State registration of residential subdivisions and requirements for full disclosure of project characteristics to prospective buyers?

☐ Yes

☐ No

b. State registration of residential subdivisions and State requirements of performance bonds to insure the construction of promised subdivision improvements?

☐ Yes

☐ No

c. State registration of residential subdivisions and State provision for consumers' rights of recision during a specified period?

☐ Yes

☐ No

33. Would you favor local administration of any of these regulations?

☐ Yes

☐ No

a. (If Yes) Which ones?

☐ Full disclosure

☐ Performance bonding

☐ Recision rights

34. The Coastal Area Management Act (CAMA) was adopted to provide a management scheme to preserve coastal ecological conditions, insure sound land and water resources uses, and maintain the orderly development of the area's resources. The following questions focus on your perceptions of how well CAMA has worked in this county (community). First, the members of the Coastal Resources Commission (CRC) are supposed to represent the various interests involved in coastal development. Do you think it has done an excellent job of this, a good job, fair job, or a poor job in balancing coastal interests?

☐ Excellent job of balancing coastal interests

☐ Good job of balancing coastal interests

☐ Fair job of balancing coastal interests

☐ Poor job of balancing coastal interests

a. Why is that?

_____

_____

_____

35. Did the CRC give the county (community) government enough freedom to design land use plans that were in their best interests?

☐ Yes

☐ No

36. Do you feel that enforcement procedures give adequate weight to your county's (community's) government?

☐ Yes

☐ No

37. The CAMA requires that the public be given the opportunity to become involved with the development of land use plans, the selection of areas of environmental concern (AEC), and in considerations of permit requests. Do you believe that the CRC has provided the public with an excellent, good, fair, or poor opportunity to become involved with the implementation of the CAMA?

☐ Excellent

☐ Good

☐ Fair

☐ Poor

38. How about actual public participation. Do you believe that participation in implementation decisions has been excellent, good, fair, or poor?

☐ Excellent

☐ Good

☐ Fair

☐ Poor

39. Do you feel that the CRC has been very receptive, somewhat receptive, or not at all receptive to the ideas of the public?

☐ Very receptive

☐ Somewhat receptive

☐ Not at all receptive

40. Do you know of any outstanding examples of where CRC has acted on a suggestion from the general public?

☐ Yes

☐ No

a. (If Yes) What was that? _____

_____

41. Under the CAMA, permits are to be issued for development in AEC's. "Minor developments," that is, 20 acres or less or less than 60,000 square feet, are issued at the local level, with "major development" permits being given at the state level. Do you believe that the criteria by which "major" and "minor" developments are defined is the best way of deciding who should grant development permits?

☐ Yes

☐ No

a. (If No) Why not?

_____

_____

b. (If No) What criteria, if any, would you suggest?

☐ None

_____

_____

_____

42. The CRC is attempting to develop a better coordinated and more unified system of granting environmental and land use permits. The Commission would like to grant one permit covering all the permits now required for development. Are you in favor of this type of permitting system?

☐ Yes

☐ No

a. (If No) Why is that?

_____

_____

43. Beaches, sand dunes, coastal marshlands, estuarine waters, and other important natural features have been designated "Areas of Environmental Concern" (AEC) by the CRC. In this county (community) have the AEC designations included all natural areas needing protection, most, but not all of the areas needing protection, or only a few of the areas needing protection?

☐ All natural areas needing protection

☐ Most, but not all of the areas needing protection

☐ Only a few of the areas needing protection

a. (If Not All) What additional areas of your county (community) should have been designated as areas of environmental concern?

_____

_____

_____

44. Is the practice of designating areas of environmental concern fair to land owners?

☐ Yes

☐ No

a. Why is that?

_____

_____

_____

45. Overall, how would you rate the impact that the CAMA has had on your county (community)? Would you say it has been very beneficial, somewhat beneficial, of no benefit, or harmful to the county (community)?

☐ Very beneficial

☐ Somewhat beneficial

☐ Of no benefit

☐ Harmful

46. Would you say that CAMA has significantly reduced environmental disruption, reduced environmental disruption somewhat, had no influence, or, indirectly, increased environmental disruption from second home development?

☐ Significantly reduced environmental disruption

☐ Somewhat reduced environmental disruption

☐ No influence on environmental disruption

☐ Increased environmental disruption

a. Can you cite any examples of how CAMA has had this effect?

_____

_____

_____

47. Because of CAMA, counties (communities) developed sets of governmental policies as a portion of their land use plans. Do you think that these policies will have a significant effect, moderate effect, or no effect on future local government decisions?

☐ Significant

☐ Moderate

☐ No effect

a. Why is that? _____

_____

_____

48. At the present time, what examples can you give me of how the county's (community's) plan has been of use to you in making decisions as a (county commissioner/town alderman, county/town manager, county/town planning commissioner, planner, sanitarian, soil conservationist, building inspector)?

☐ None

_____

_____

_____

49. Who prepared your county's (community's) land use plan which was required by CAMA?

☐ Planning Department

☐ Planning Board

☐ Commissioners

☐ CRC

☐ Other, who? _____

50. A number of agencies can provide assistance to counties (communities) in their land use planning. How would you rank the amount of assistance that your county (community) has received from the following organizations?

Rank 1 through 3 (1 = most help received, 2 next most assistance, etc.)

_____ Council of Governments

_____ Coastal Resources Commission

_____ Department of Natural Resources and Community Development Field Office Planning Staff

51. Before concluding the interview, are there any additional comments you would care to make about leisure home and recreational land development in this county (community), the effects of development on the county (community), or the county's (community's) activities in planning for and regulating development?

☐

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR ASSISTANCE

APPENDIX D

FOLLOW-UP SURVEY OF PUBLIC OFFICIALS: FALL 1978

County or Community: _____ Interview No.: _____

CONFIDENTIAL

WATER RESOURCE CONSEQUENCES OF SECOND HOME
AND RECREATIONAL LAND DEVELOPMENT

FOLLOW-UP
Survey of Public Officials

Respondent's Name: _____ Interviewer: _____

Position: _____ Date: _____

Organization: _____ Time of Interview: _____

Address: _____ Length of Interview: _____

City: _____ _____

Telephone Number: _____ Interview Completed: _____

* * * * * * * *

First Introduction: Good _____. I'm _____ calling long distance from the Center for Urban and Regional Studies at The University of North Carolina at Chapel Hill. May I speak with _____/Name of public official.

Second Introduction. Good _____. I'm _____ calling long distance from the Center for Urban and Regional Studies at The University of North Carolina at Chapel Hill. As you may recall, we interviewed you last (fall/spring) as part of our study of residential recreational development practices and outcomes in North Carolina. I would like to ask you several follow-up questions and I'll be as brief as I can. (Go Directly to Q. 1 Without Pausing.)

* * * * * * * *

Center for Urban and Regional Studies
The University of North Carolina at Chapel Hill

Fall 1978

1. One result of our survey indicated that there is a need for alternatives to land use regulations. These could include environmental awareness programs, free technical assistance to land developers and incentives for increased citizen participation in local government. Are you aware of any such activities in your county (community)?

   [1] Yes

   [5] No--Go to Q. 2

   a. (If Yes) What are they? _____

   _____

   _____

2. In your opinion, would environmental awareness activities in high schools, community colleges and community centers have a significant effect, moderate effect, or no effect on improving the quality of development in your county (community)?

   [1] Significant effect

   [3] Moderate effect

   [5] No effect

   a. Why is that? _____

   _____

   _____

3. Do you think that free technical assistance to land developers would have a significant effect, moderate effect, or no effect on the quality of land development in your county (community)?

   [1] Significant effect

   [3] Moderate effect

   [5] No effect

   a. Why is that? _____

   _____

   _____

4. Do you think that increased citizen oversight of local government decision-making would have a significant effect, moderate effect, or no effect on the quality of land development in your county (community)?

[1] Significant effect

[3] Moderate effect

[5] No effect

a. Why is that? _____

_____

_____

5. Are you familiar with any of the following programs, organizations, or agencies?

a. Sea Grant College Program

[1] Yes →

[5] No

[9] Inap. (mountain official)

↓

b. Marine Resources Centers

[1] Yes →

[5] No

[9] Inap. (mountain official)

↓

c. Agricultural Extension Service

[1] Yes →

[5] No

↓

6. (If Yes) Do you think they (it) should do more, about the same, or less to help promote good land development?

a. Sea Grant College Program

[1] More

[3] About the same

[5] Less

[9] N/A

b. Marine Resources Centers

[1] More

[3] About the same

[5] Less

[9] N/A

c. Agricultural Extension Service

[1] More

[3] About the same

[5] Less

[9] N/A

d. Soil and Water Conservation Districts

[1] Yes → d. Soil and Water Conservation Districts

[1] More
[3] About the same
[5] Less
[9] N/A

[5] No ↓

e. Community Involvement Councils

[1] Yes → e. Community Involvement Councils

[1] More
[3] About the same
[5] Less
[9] N/A

[5] No ↓

f. County Planning Commissions

[1] Yes → f. County Planning Commissions

[1] More
[3] About the same
[5] Less
[9] N/A

[5] No ↓

g. Economic Development Councils

[1] Yes → g. Economic Development Councils

[1] More
[3] About the same
[5] Less
[9] N/A

[5] No ↓

h. Community Colleges

[1] Yes → h. Community Colleges

[1] More
[3] About the same
[5] Less
[9] N/A

[5] No ↓

6. Our survey indicates that zoning regulations in your county (community) have:

[1] Been adopted

[5] Not been adopted

a. Since we interviewed you last (fall/spring), have there been any changes in the status of zoning--has it been adopted (repealed)?

[1] Adopted

[3] Repealed

[5] Never adopted

b. And, how do you feel about county (community) zoning? Are you strongly in favor of it, somewhat in favor, neutral, somewhat opposed or strongly opposed to zoning in your county (community)?

[1] Strongly in favor

[2] Somewhat in favor

[3] Neutral

[4] Somewhat opposed

[5] Strongly opposed

7. Our survey indicates that subdivision regulations in your county (community) have:

[1] Been adopted

[5] Not been adopted

a. Since your interview, have there been any changes in the status of subdivision regulations--have they been adopted (repealed)?

[1] Adopted

[3] Repealed

[5] Never adopted

b. And, how do you feel about county (community) subdivision regulations? Are you strongly in favor of them, somewhat in favor, neutral, somewhat opposed or strongly opposed to subdivision regulations in your county (community)?

[1] Strongly in favor

[2] Somewhat in favor

[3] Neutral

[4] Somewhat opposed

[5] Strongly opposed

8. Our survey indicates that a sedimentation pollution control ordinance in your county (community) has:

[1] Been adopted

[5] Not been adopted

a. Since your interview, have there been any changes in the status of sedimentation pollution control regulations--have they been adopted (repealed)?

[1] Adopted

[3] Repealed

[5] Never adopted

b. And, how do you feel about a county (community) sedimentation pollution control ordinance? Are you strongly in favor of it, somewhat in favor, neutral, somewhat opposed or strongly opposed to sedimentation regulations in your county (community)?

[1] Strongly in favor

[2] Somewhat in favor

[3] Neutral

[4] Somewhat opposed

[5] Strongly opposed

9. Do you think local land use regulation has been very effective, somewhat effective, or not effective in improving the quality of development in your county (community)?

[1] Very effective

[3] Somewhat effective

[5] Not effective

10. (Mountain Public Officials Only) The State of North Carolina has sketched an outline for statewide land-use planning that would give local governments the primary role in planning their growth. Do you think that a state mandated land classification plan would be very beneficial, somewhat beneficial, of no benefit, or harmful to your county?

[1] Very beneficial

[2] Somewhat beneficial

[3] Of no benefit

[4] Harmful

[9] Inap. (coastal official)

a. Would you favor or oppose state financial assistance to enable counties and local communities to engage in land use planning?

[1] Favor

[3] No opinion

[5] Opposed

[9] Inap. (coastal official)

b. If the State of North Carolina does extend financial assistance for local planning, do you think it should establish standards for what the plans cover, such as the identification of critical environmental areas?

[1] Yes

[3] No opinion

[5] No

[9] Inap. (coastal official)

11. (Coastal Public Officials Only) Since March 1, 1978, CAMA building permits have been issued for development in "Areas of Environmental Concern." Do you think that these permits have had a significant effect, moderate effect, or no effect on improving the quality of development in your county (community)?

[1] Significant effect

[3] Moderate effect

[5] No effect

[9] Inap. (mountain official)

a. Why is that? _____

_____

_____

12. Is insurance through the Federal government's National Flood Insurance Program available in your county (community)?

[1] Yes

[5] No--Go to Q. 13

[9] Don't know--Go to Q. 13

a. (If Yes) Do you think that the National Flood Insurance Program has had a significant effect, moderate effect, no effect, or a negative effect on improving the quality of development in your county (community)?

[1] Significant effect

[2] Moderate effect

[3] No effect

[4] Negative effect

[9] Inap. (community not participating in program)

b. Why is that? _____

_____

_____

13. Before closing, I have several questions about yourself that we need to help us categorize the responses. First, how many years have you been a resident of _____/County (Community)?

_____ Number of Years

14. How many years have you held your present position as _____?

_____ Number of Years

15. What other governmental positions have you held?

[9] None

_____

_____

_____

16. And, altogether how many years have you served as a public official/ employee?

_____ Number of Years

17. How many years of education have you had?

[1] 0 - 8 grades

[2] 9 - 11 grades, some high school

[3] 9 - 11 grades, plus vocational training

[4] 12 grades, high school graduate

[5] 12 grades, plus vocational

[6] 13 - 15 years, some college

[7] 16 years, college graduate

[8] 17 or more, graduate or professional training

[9] N/A

18. From what occupation do you derive your primary source of income?

_____

_____

_____

THANK YOU VERY MUCH FOR YOUR ASSISTANCE